



**Amazing**

**Exclusive:** An Interview with Iwin's Martin Steinbach

# Amazing / AMIGA

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Volume 14 No. 9 1999  
US \$4.95 Canada \$7.25

## What Next?

Collas Resigns  
Iwin Announces  
Amiga goes dark!  
Just What is the  
Amiga's Future?

News from  
AmigaFest  
Amiga Downunder

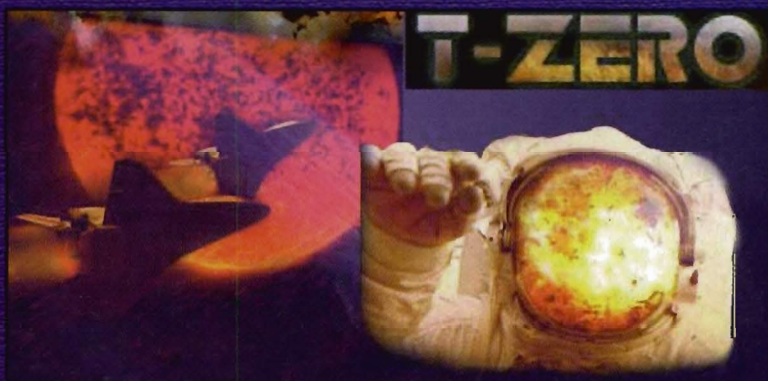
## New Games

The Trauma Zone (T-ZerO)  
Muscarine  
Games in development!

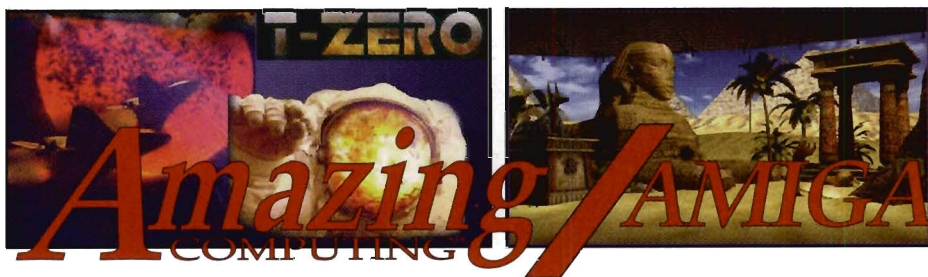
Plus: REBOL, Unix,  
DTP and more.



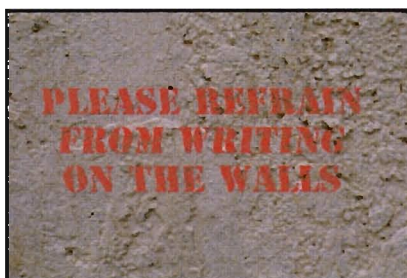
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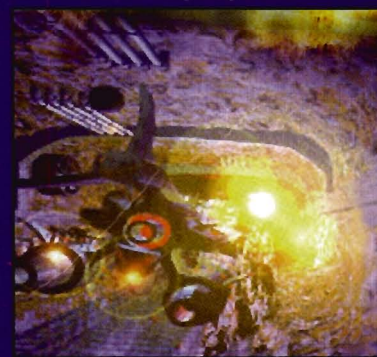
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# FEEDBACK

## Reactions

Dear AC:

Just a note to say I intend to remain with the Amiga and its developers, despite the recent announcement by Amiga of "no more announcements". I really don't know what they're doing; IMHO (In My Humble Opinion) there ought to have been a push for PPC (including porting of AmigaOS), but, as they say, that's water under the bridge.

I will be renewing my subscription to *Amazing* and hope that we will be able to continue reading about the Amiga and development of new s/w and h/w for the foreseeable future.

I'm not trying to be nasty to GW or AI, but the current Amiga architecture still has a lot to offer both casual users and graphics/development professionals.

Best wishes!  
Rich Delzenaro

*If the current Amiga does what you need, then you have a tool that works. This is one truism that we tend to forget.*

*However, we would like to see the Amiga grow and prosper. Only through development can we sustain our dealers and vendors. Lets hope we can find the answers.*

Dear AC:

This has been a difficult bit of news to swallow for a lot of Amigans. As a group, we are \*very\* protective of our platform. When someone comes on board to run the show, we are at first suspicious, both of the new arrival, and of the circumstances behind the departure of the old one. After a time with the new boy, we get to be friendly with him, too. This time is no exception.

We don't know who this Schmidt person is, and we want to know—after all, he \*is\* steering \*our\* ship. That's right. I said \*our\* ship. Gateway may hold the legal rights, but \*we\* hold the blood, sweat, and tears. \*We\* are the ones that have kept this ship afloat, not them. This is \*our\* ship.

On top of that, we want to know what's happened to our friends, Jim and Bill. A terse "they're gone, get over it, we ain't talkin' anymore, see ya later" isn't going to cut it with this crew.

Amiga LLC wants our support. We want honesty. Saying someone quit when they didn't is a lie, pure and simple—and uncalled for.

We have been stepped on, spit on, ignored, robbed of our legacy, laughed at, and left for dead more times than anyone but a Christian would believe possible. Any company that tries to take our Boing Ball and go home is going to get a knock on the door. We're not leaving.

William F. Maddock  
wmaddock@icon-stl.net

*Our response to Amiga Inc. needs to be tempered with realism. Amiga Inc. wants to make money with a new design. They have a different agenda. We need to work around their goals and needs in order to attain our own.*

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<http://www.plmpub.com>

*Amazing Computing/Amiga™* (ISSN 1053-4547) is published monthly by PIM Publications, Inc., P.O. Box 9490, Fall River, MA 02720, Phone 1-508-678-4200, 1-800-345-3360, and FAX 1-508-675-6002.

U.S. subscription rate is \$29.95 for 12 issues. Subscriptions outside the U.S. are as follows: Canada & Mexico \$39.95 (U.S. funds) one year only; Foreign Surface \$49.95. All payments must be in U.S. funds on a U.S. bank. Due to erratic postal changes, all foreign rates are one-year only.

Periodical Postage paid at Fall River, MA 02722.

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Distributed in the U.S. & Canada by  
International Periodical Distributors  
674 Via de la Valle, Ste 204, Solana Beach, CA  
92075

&  
Ingram Periodicals Inc.  
1226 Hell Quaker Blvd., La Verne TN 37086

**Printed in U.S.A.**

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# Editorial Content

## What now, Amiga?

### What a difference a month makes

Last month, I extolled the virtues of looking toward the future. I spoke of the commitment of *Amazing* to bring you all the news we can print on both the current Amiga technology and the future from Amiga Inc. This was written in good faith and with the commitment by Amiga's Jim Collas to help the original Amiga market as well as the new AmigaNG.

Jim Collas made a lot of promises to the Amiga community at the World of Amiga at the end of July (see *Amazing Computing/Amiga* issue 14.08). In front of hundreds of people and later before the press, Mr. Collas released his plans for the Amiga market. They were great plans that included a new future for the Amiga brand as well as support for the current Amiga user base. This support included OS 3.5 in the short term and possibly the inclusion of the Amiga Classic line in the AmigaNG's network.

I had made tapes of these events and I was ready to release them, when Jim asked that I not. He said that he was preparing a special "Amiga Awareness Day" presentation for the Amiga community and he wanted to create a "fresh look" in a new video with the ideas he had covered at the WOA. He believed our tapes would be a distraction. I relented, reluctantly, under Jim's urgings and assurances. Then I made several suggestions on what we could do to help with the "Amiga Awareness Day" promotion. This was around July 28th and it was the last time I spoke with Jim Collas.

In mid August, as we were putting this issue together, I was informed that Amiga programs Amiga Inc. had OK'd for *Amazing* would not be supported. When I stated that we had already received approval from Amiga Inc. and we had initiated the programs with some Amiga developers, I was told by a top executive at Amiga Inc. that, "Things change." Almost to the hour, I received a note from

Amiga International to pull their advertising due to changed budgets. A dozen warning lights went off (hey, Petro is not the only one who has suffered through three bankruptcies with the Amiga). What was going on?

On August 27th, Amiga Inc. posted the following on their web site, "For the next several months, the Amiga staff will be focused on implementing our business and product plans. We will not be discussing or commenting on future company directions during this time." At the same time, they removed past executive updates and the MCC tech brief (see *Amazing* 14.08). A message was circulated that this was due to competitive pressures.

Although I was already due at press, we were halted because of delays receiving several advertisers material and, because of our reduced advertising revenue, we needed (for the first time since the spring of 1995) to reduce our page count. This new information of an Amiga "blackout" set off more warnings. What exactly was Amiga Inc. doing?

Then on Monday, August 30th, I received news that Amiga's community liaison, Bill McEwen, was leaving Amiga. The next day, I received the following by email, "To my friends within the Amiga press. This is indeed a very sad day for me as I will no longer be with Amiga effective August 31st 1999. I do not know what I will be doing, or where I will end up, but Amiga is definitely in my heart and soul."

"You are a group without compromise and I have enjoyed working with each of you and God willing I will have the chance to work with you again. I have had a great time working with the developer community, and the user group community."

I had been aware that Bill had been placed on a temporary contract when he had not relocated to San Diego. I also knew that several programs he had outlined and created had been received with enthusiasm at Amiga. Bill had been under the impression the programs were approved and he was to be offered a regular position at Amiga.

Then, two days later, a rumor spread that Jim Collas was no longer at Amiga Inc. Several news services carried stories that he had resigned and cashed in his Gateway stock options worth approximately \$11 million. While this is not bad for Jim's seven years of work (I believe he was also getting a regular paycheck while he was there), it was certainly not good news for the Amiga. And, unfortunately, I could get no one at Amiga Inc. to remark on or off the record. Then, just a few days ago, on September 6th, the following appeared on the Amiga Inc. web site:

#### Dear Amigans:

I wanted to make sure everyone knew that Jim Collas has chosen to leave Amiga to pursue other interests and opportunities. I would like to personally thank Jim for the leadership and vision he brought to Amiga and the entire Amiga community over the past

eight months. We wish him the best of luck in his new endeavors.

I have been with Amiga since April of this year as the Chief Operating Officer and I continue to be extremely excited about the plans and strategies we have been working very hard on the past several months. Those plans will continue with a great business and technology leadership team focused on the emerging Internet Appliance market space. As we finalize our plans in this area, we will communicate those to the community.

I would also like to thank Bill McEwen for his many contributions to the Amiga community and wish him the best of luck in his future endeavors. Bill has been a steady and calming voice to the community.

Regards, Thomas J. Schmidt, President

Good sentiments, but what does it mean to the Amiga? Even in the worst of times, we have had options. However, due to deadline pressures, I do not have the time to wait for clarification from a company that has already stated they will say nothing.

After a remarkable World of Amiga showing in London with Amiga making speeches and holding press conferences, Amiga Inc. has gone through several changes in both their personnel and their attitude. From Jim's statements last month, this is the time things should be happening. Apparently, we just don't know what.

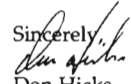
From the above statements by Mr. Schmidt, we could agree all is going as planned. But, the other incidents make me cautious. Due to deadline pressures, there is no time for clarification from a company that has promised to say nothing.

Meanwhile, Iwin (please see the interview in this issue), QNX, and, it is rumored, a few individuals are making advances on the Amiga. *Amazing's* task is to identify what is real and attainable.

This issue's diminished size might have a negative effect on the North American Amiga market. Yet, we have no choice, if Amiga vendors are not able to get product, make sales, and earn a living, then we need to design a system where they can. We stated many years ago *Amazing* would continue as long as there was an Amiga market. If this means removing *Amazing* from the newsstands to lower ad prices for Amiga vendors to keep them in the here, we just may need to do that.

Meanwhile, faced with a smaller size, we have redesigned layouts, crunched articles, reduced type size (just look at this page) and attempted to deliver the same great magazine to our readers. Our goal is to continue bringing the Amiga market complete and accurate information on this platform.

As soon as this issue is mailed, we will be rushing to complete the next issue. No doubt Amiga Inc. or another Amiga supplier will make some changes, as of now, we don't know. But, when we can discover what is happening, you know you will see it and more in the pages of the next issue of *Amazing Computing*.

Sincerely,  
  
Don Hicks  
Managing Editor

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Call 888-AMIGA-77 to join the Amiga revolution or visit their website at [www.AmigaOnline.NET](http://www.AmigaOnline.NET).

## Amiga 2K: The Amiga show for the year 2000.

Amigan-St. Louis has announced Amiga 2K for next April. Amiga 2K is the next Gateway Computer Show. It will be held at the Henry VIII Hotel, in St. Louis MO. U.S.A April 7 - 9, 2000. More information will be made available as the show date approaches. For the latest information, check their web page at: <http://www.amiga-stl.com>

Amiga 99 (in March 1999) drew an attendance of 1,142 people, a 14% increase over 1998. Dealers, distributors, shareware and commercial developers, clubs and others interested in exhibiting, should contact Amigan-St. Louis via email for details on costs and further details. For exhibitor information, email Bob Scharp at [bscharp@icon-stl.net](mailto:bscharp@icon-stl.net)

Amigan-St. Louis, P.O. Box 672, Bridgeton, MO 63044, web page: <http://www.amiga-stl.com>, email: [bscharp@icon-stl.net](mailto:bscharp@icon-stl.net),

## E4000

Computer City has announced the availability of the E4000, a computer based on the Amiga 4000 mainboard. The E4000 consists of a standard Amiga 4000 mainboard (NEW) built in a ELBOX Ebox tower (also known as Power Tower or Winner Tower). The processor boards used are manufactured by Apollo, Commodore (3640) and DCE (CyberStorm). AmigaOS 3.5 comes with the E4000 (If you buy an E4000 before OS 3.5 is out, it will be sent to you free of charge when it has been released). The E4000 is based on the Amiga 4000 mainboard with a CPU slot for PPC expansions.

Supplied only while stock is available. All components are available in virtually unlimited capacity except for the A4000

mainboards. When these run out, the supply of E4000s will end (obviously).

The E4000 consists of a Midi-Tower with 230 Watt power supply, 2 MB Chip memory (on A4000 mainboard), IDE Controller (on A4000 mainboard), SCSI2 Controller (on processor board) for harddrives and CD-ROMs, 7 Zorro II/III slots, 5 ISA Slots (non-active), 2 Video Slots, and 3.5" Floppy Drive HD 1.76 MB. It comes with an original A4000 Keyboard and Amiga Mouse, a 40-speed IDE CD-ROM drive, a 13.1 GB IDE harddisk, and, of course, AmigaOS 3.5 (when available).

The technical specifications of Apollo versions include a 68040 (40 MHz.) or a 68060 (50 MHz.) CPU (full versions) and 32MB Fast memory (on processor board) maximum 128MB. The 3640 version has a 68040 25 MHz. CPU (full version) with 16 MB of Fast memory on the mainboard. CyberStorm MkIII versions include a 68060 (50 MHz.) CPU (full version) and 32 MB of Fast memory (2 x 16 MB on processor board) maximum 128 MB.

The E4000/Apollo 040: will sell for HFL 3499.00, EURO 1587.78, and \$1,612.44US. The E4000/Apollo 060 will sell for HFL 3999.00, EURO 1814.67, and \$1,842.86US. The E4000/3640 is priced at:

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### Amiga Forever 3.0

Cloanto has launched the latest version of Amiga Forever on a cross-platform CD-ROM and as a downloadable online edition for Windows. Amiga Forever contains a complete and ready-to-use emulation solution to run Amiga software under Windows, Linux and other systems, and a suite of Amiga utility and cross-platform data sharing applications.

For Amiga Forever 3.0, Cloanto extended its license, which covers all Amiga patents, trademarks and copyrights, to include version 3.1 of the Amiga ROM and operating system. This version of the Amiga ROM represents the end of the line of the "Classic Amiga", and will be required by future OS revisions, such as version 3.5.

A downloadable Amiga Forever 3.0 upgrade is now available online for \$14.99 for both the Amiga Forever 2.0 CD-ROM and the online edition. The upgrade installs the new items of Amiga Forever 3.0: Amiga 3.1 ROM and OS files, Amiga Explorer 3.02 (client and server), Personal Paint 7.1b, TurboText, more than a dozen preinstalled add-ons (drag-and-drop LhA, ToolManager, etc.), as well as the latest version of WinUAE tested by Cloanto

The latest version of the emulation software includes experimental support for AGA display and MIDI output. The CD-ROM version of Amiga Forever 3.0 additionally contains a StuffIt archive with a complete, preconfigured PowerMac configuration of the Amiga emulation environment.

The CD version of Amiga Forever 3.0 also contains audio tracks including an exclusive interview with the late Jay Miner, "Father of the Amiga", and a complete collection of Amiga ROMs and operating systems released since 1985, starting from version 1.0.

Amiga Forever Home Page: <http://amigaforever.com>

### Bertie's Animal Kingdom

Epic Marketing has announced the release of a brand new children's title, Bertie's Animal kingdom. This will be the first in range of products aimed at small children.

Bertie's Animal Kingdom is an animal recognition game designed for nursery, and pre-school children. The only requirement is that the child must have a basic knowledge of how to use a mouse. Keyboard controls are not required, except to enter the child's name for the score table. All actions which the child does highlight different areas of the screen in a bright color so that they know what they are doing if they click the mouse button on that spot.

For some younger children it may be advisable for a parent to stay with them and monitor their progress or to help them with reading, etc. All main text in the game is displayed in a large vivid white font.

In the game, the child is helped along by a cartoon character called "Bertie". He gives them a task to perform, tells them what to do, and when the task is complete he tells them how well they did. Each question answered correctly will award them 1-3 gold stars which are shown at all times in the top left of the screen. This is to encourage them to beat this score with each new attempt.

Bertie's Animal Kingdom is available on Floppy or CD at only £10.00 The CD version has extra speech and 7 bonus games. Please check their web site at: <http://www.epicmarketing.ltd.net>

### Genesis Odyssey PPC G3

There have been a number of developments regarding Odyssey PPC systems based on imminent release of the G3 modules, The Odyssey PPC G3 systems will ship with QNX Neutrino OS with AmigaOS 3.1 and 3.5 compatibility; Ultra II Wide,





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Ultra DMA IDE/ATA, CyberVisionNG and IEEE-1394 (FireWire), modules are available for Odyssey PPC G3. There is a price reduction for Odyssey PPC 603e based systems. Pricing and details for the new Odyssey PPC G3 can be found at: <http://www.randomize.com/genesis>.

Randomize, Inc., R.R. #2, Tottenham, Ont., L0G 1W0, Phone: 1-888-726-3664 or 905-939-8371, Fax: 905-939-8745, email: [sales@randomize.com](mailto:sales@randomize.com), WWW: [www.randomize.com](http://www.randomize.com).

### AmTALK II - 2.0 available

AmTALK II is a combined server/client for the Internet TALK protocol for point-to-point online chatting. Some of AmTALK II features include: fully

multithreaded for several talk sessions at once, "Locate" function to locate an AmTALK II user on a dynamic IP address, user configurable notification sounds; friendly GUI; and it works with Genesis, AmITCP, Miami and as225r2-derived TCP/IP stacks.

AmTALK 2.0 is available at <ftp.vapor.com>, /pub/amtalk/, or go to <http://www.vapor.com/downloads/> (contains information about all mirror sites), or send email to [fileserv@vapor.com](mailto:fileserv@vapor.com), put "SEND AMTALK" in mail body.

### AmIRC 3.0 released

AmIRC 3.0 has received major changes since Release 2.2 which include: support for colored text, support for "inline" clickable URLs, optional "Timestamping" of viewer lines, many additions to Plugin API, additions to ARexx port, GUI improvements, several new user commands, and more. Unlike the previous 9 updates, the AmIRC 3.0

upgrade is not free. There will be a special upgrade offer for current AmIRC 1.x and AmIRC 2.x users. Please see <http://www.vapor.com/update/> for information on upgrade process and fees.

•AC•

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## An Interview with Iwin's Martin Steinbach

Just prior to the lights going out at Amiga Inc., Martin Steinbach of Iwin Corporation began announcing a new Amiga. OK, actually a new design for the older Amiga. Many people believed the price and quick production times quoted by Mr. Steinbach were beyond credibility. His announcement on-line received mixed reviews from a beleaguered Amiga community.

AC has always discussed new products as they have been announced and we see no reason to fault Iwin just because they have given us everything we have asked for (including a new chance to live). However, Iwin is a quandary. Although the web site is intensive, there are no direct contact numbers for information (I tracked Mr. Steinbach down using Iwin's internet address information on Internic). Their products do seem too good to be true and they are incorporated in Delaware (a state notorious for quick corporations). This is why many readers on the internet disbelieve Iwin's claims. They insist this is an elaborate hoax.

On the other hand, Iwin has asked for no money (such as a request for pre-orders), they do maintain a web site in better condition than most of the Amiga market (including *Amazing*), and much of what they have done has not been cheap. Outside of a good laugh, where is the payoff if this is a hoax?

Intrigued, *Amazing* contacted Mr. Steinbach and requested an interview. We asked several questions in a phone interview and then sent more by email. This is the result.

AC: What is your title at Iwin?

MS: My title is President and Chairman of the Board.

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AC: But you're also doing the website?

MS: I'm doing some of the website, yes.

AC: How big is Iwin?

MS: We have 338 persons working for us. Not all of them are employees, some of them are free-lancers. In Germany we have just twelve persons. We have people in America, there are also ex-Commodore employees. We have some guys in France, in Russia more.

AC: Are they working under Iwin or are they working under the two former companies?

MS: They're working under Iwin.

AC: We've heard nothing about Iwin until now. Was that intentional?

MS: It's only been here since the fourteenth of June, since the merger. We wanted to keep the silence because we knew what would happen when we announced a new Amiga in the Amiga community. We were reading all the newsgroups, all the time we were reading the Amiga magazines, and we knew how many announcements had already been made. We knew what response we would get, and actually we thought it was even too early to make an announcement. I was planning to make this announcement maybe two or three weeks before this press conference to show them the computer field, to show them the Amiga running.

AC: Are you using your own design, or is this merely just a PC with an emulator thrown on top of it?

MS: It's definitely not an Amiga. This is what most people still think, but it's definitely not an Amiga. It's a completely new design, it's a new computer. Many people say, for example, how can we give 8 MB of chip RAM and so on. It's definitely a new computer, and so we don't have all these limitations of the classic Amiga.

AC: The Power SE is a program you created several years ago and is a part of your new Amiga design?

MS: A very small part of it, yes.

AC: DDKI and the IDDK: one is a piece of firmware and one is a piece of software, is that correct?

MS: That's correct. DDKI is a piece of software which runs on top of the IDDK. IDDK is basically a normal custom chip with the DDKI software in it. It installs memory, other things and so on. It also initializes the boot process. Once the boot process is initialized and the memory and so on, the software part of this IDDK will act.

AC: Is the emulation in firmware or is that in loadable software?

MS: It's in firmware.

AC: You don't infringe on any patents whatsoever with Amiga?

MS: This is the reason why we will talk to Amiga. UAE is just software, and if you're taking the basic software and implement it in chips, that's basically what we did. It doesn't mean that we used the software in our chips, but we used that way to go around every Amiga custom chip.

AC: Do you still feel confident that your devices do not interfere with Amiga Inc.'s rights?

MS: Well, the same question would be if UAE does interfere with Amiga Inc. rights. This will be sure one of our questions when we meet with Amiga Inc.

AC: Do you still have meetings planned with Amiga Inc.?

MS: We will try to find a convenient time and date for us and Amiga Inc. But we can't say when it will be.

AC: Has Jim Collas exit from Amiga Inc. and their news black out changed anything for Iwin?

MS: No. There is no change in our goals. However, we are not negotiating with Tulip about C= anymore.

AC: Did you start production on September 6th as planned?

MS: No. Production start was on the 8th of September due to some problems with the CPU shipment.

AC: Is the current delivery of product scheduled for September 20th?

MS: The current schedule is 20th - 25th of September. We will give an update of that when it gets close to the release date.

AC: Will you be attending the Indianapolis Amiga show around October 8th?

MS: We have sent the application form and received an answer. Currently we are preparing the prepayment of the tables and booths there.

AC: Have you contacted any third-party developers to be sure you'll get hardware support, that all the PCI stuff will work in your products and so forth?

MS: As I said, we have three partners. We are currently not allowed to say the name of the partners, but we will shortly before the products leave. There will be a press conference in Germany or Belgium where we will give all of the names of these three hardware partners. We've contracted to software partners. We can only say the names in about a week, but I can say that these two firms were already involved in Amiga games some time ago, and Commodore at times. Within two or three weeks of the products' release there will be some games with their label.

AC: Will this system work with NewTek's Flyer and Toaster?

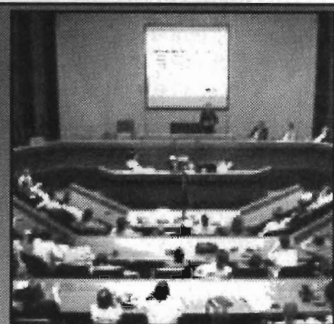
MS: Usually it should. We don't have a Flyer or Toaster here, but we will test them.



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AC: I noticed that your website is strictly English. Are you planning on doing other languages on the website?

MS: We are currently translating them into German and some other languages.

AC: Are you going to create a sales office in North America?

MS: Yes, we are planning to open a sales office in Texas.

AC: Are you planning on doing assembly in Texas also?

MS: Yes.

AC: I guess a big question on everybody's mind is how did you raise the capital?

MS: Of course I have some stock, but we don't have public shares. Two people on the board are rich, and they have invested a lot of money already. We borrowed some money from banks, and the whole development plan of the custom chips is financed by our partner firms, so it didn't cost us anything.

AC: You stayed quiet over two years creating this Amiga OS. The current Amiga OS does not run unencumbered on a PowerPC. How did you emulate it?

MS: This is the part of PowerSE. That's the main thing that PowerSE does is normal interlocking architecture, and we've ported some parts to PowerPC architecture, to be able to run various other operating

systems on it. The parts that we did were just to run Amiga wares on it, so that's the complete emulation.

AC: That's a pretty amazing piece of technology.

MS: As I said before, we have some developers that are free-lancers. For example, I was doing a lot in the Amiga, I was encoding a lot on Amiga to decipher for some groups. Our people really know a lot about the Amiga, and they know this machine very well. We did it in the last two years.

AC: Have you released prices for the C5300 and the C5400? Where would we find those prices?

MS: They are currently not on-line because a lot of people were complaining about it, asking thousands of questions about how we can keep those prices. What I can say is that we won't make any profit on the C5300, but we will make profit on the C5400 and the A2010. So the prices are very low for the Amiga market, but that's if you are using just the standard complements of custom chips. It is quite easy to keep these low prices. We are also searching for a new name for the C64x32 and the A2010.

AC: You also talked about PC compatibility. Will these same units be PC compat-

ible? Will we be able to run Windows on these also, or will they be just Amiga?

MS: Amiga OS won't be able to run PC software, but we will be able to boot into this PowerSE and light version of desktop environment. From this environment you will be able to run Windows applications.

AC: Considering the difficulties in the market and so forth, why are you interested in the Amiga market?

MS: That's a good question. I'm an Amiga freak. I like those machines very much. I have some Amigas here at home, we always have some Amigas in the offices. We still believe that if there is a new computer that runs Amiga OS based on the technology, people who changed from Amiga to PC will come back to Amiga. This was one of the major reasons for starting this project.

AC: When will we see specifications on the A2010?

MS: They will be released during the press-conference.

AC: Do you see any further upward path for the Amiga after you do the A2010?

MS: Yes, we have some further projects. We have one project that is not for publication right now, we have one project currently on hold because we have to develop resources for the current project, which is



a portable computer based in Amiga technology. We have some sort of project, or at least some ideas about a PPC only computer.

AC: There is some question about the long-term availability of PowerPCs.

MS: There aren't a lot of choices. I mean, we can go to PowerPC architecture, but I personally don't see a reason for going to interlock architecture. There would maybe also be MIPS architecture, which is also very powerful. It's way too expensive.

AC: Are you considering the G3 that Apple uses?

MS: Yes. The G3 and the G4. We have ideas to make the computer compatible with using the G3 or G4.

AC: You know the kinds of things this Amiga market has been under. How are the Amiga people supposed to understand that this is not a hoax?

MS: We understand very well. There is no proof until the computers are available on the market. That is what I and many people on the newsgroups are saying. There is no proof until it is really released. We can send thousands of screen shots, we can send thousands of specifications, and whatever will help. Some people are believing and trusting in us and there are some that don't believe that. We understand that, and these people who don't believe in the product, who don't trust in the product, who even don't trust in the firm Iwin are invited to wait until the product is released at the end of September. They're invited to attend the product presentation and press conference and actually see the product in action.

AC: How do you feel about the abuse you have received on-line?

MS: I can't understand it. It seems that people have a lot of time for questioning and digging, but forget that there are more important things to do. And, the only proof is the final release of our machines - nothing more but nothing less too.

AC: Is there anything you would like to say directly to the Amiga public?

MS: What I want to say is the same as I said to Jim Collas, which is that we can bring the Amiga computer, the Amiga OS, and whatever back to glory and back to what it was before, maybe four or five years ago. Amiga Inc. can do this together with partners, whoever it will be and of course us as well.

#### Specifications:

The brand new Iwin C5400 features everything users are dreaming of and were promised but didn't get. The Iwin C5400M and P workstation is the ideal computer for multimedia purpose. A large amount of RAM, excellent graphic performance for 2D and 3D environments and programs, high quality stereo sound in CD quality, various harddisk sizes, CD-ROM / DVD-ROM drive(s), ZIP / JAZ drive (options), various display types and much more makes the Iwin C5400 M and P workstation the premium choice for all multimedia purposes.

Technical details: Motorola 68060 (M Version) or PPC 604 (P Version), or PPC 750 (P+ Version), 8 MB ChipRAM and 32 MB FastRAM, 3.5" floppy (880kb and 1.4MB), SCSI 4, 6, 8 and 13 GB, ZIP / JAZ optional internal and external drive. Plus Iwin i3D graphic adapter with 3D acceleration, Iwin S32 sound card, CD / DVD ROM: standard CD-ROM integrated (40x), DVD-ROM or RAM optional with Iwin, and A-DVD software driver. Interfaces include : 2 x RS232, 1 x Par., 2 x USB (with Iwin A-USB drivers), SCSI, 2 x Joystick (classic digital), 1 x Joystick analog for PC joysticks, keyboard and mouse (mouse can also be connected to a digital joystick port), VGA monitor, TV in and out, Stereo Audio in and out, and Digital Audio in and out. There are slots for 3 x PCI, 1 x AGP (both usable in AmigaOS and PC mode - PC mode only available when using PowerSE!) 3 x Zorro III.

While the jury is divided on whether this is too good to be true, one thing is certain. With the time table Mr. Steinbach has set for himself, we should know soon.

•AC•

# The Amiga Downunder Show 1999

## A Show Report from Craig Delahoy

It wasn't all that long ago that Australia was one of the strongholds of the worldwide Amiga community, with an enviably large share of the domestic, media and educational personal computer market. Of course, that was before the Australian Commodore business jumped on the bankruptcy bandwagon many months before Commodore International went down.

Today Amiga users in Australia are few and far between - numbers continue to dwindle rapidly. Yet despite this, there is still a strong core of Amiga diehards here, a core of users and advocates that have been hanging out desperately - through more bankruptcies and countless broken promises - for a sign that things are not as bleak as some might have us believe.

For me, that sign came on the weekend of the 21st and 22nd of August, 1999 in - of all places - Canberra.

The Amiga Downunder Show 1999 was organized by members of the **Canberra Amiga User Society (CAUSE)** - in particular, Steve Kennedy (aka "Crash"), Blaz Segavac (aka "Bladez"), Kresimir Rogic (aka "Krash"), Douglas Alexander (aka "dalziel") and show coordinator James McPhee (aka "James"). Located at the Heritage Hotel in Narrabundah, a suburb of Canberra, this was the first Amiga show in Australia of any consequence for more years than many of us care to remember. This was not an official CAUSE event, but a personal odyssey for this small group - and it was all done out of their own pockets.

I must admit that I had to consider seriously whether or not I would attend. I live on the south coast of Victoria, some one thousand kilometers away. To make it to the show, I had to take two days off work (15 hours to drive up, 15 hours to drive back home). But I'd made it to many of the shows that were held in Sydney not so long ago, and I was keen to be reminded that I wasn't the only Amiga user left in Australia. So with grim determination and a thermos full of coffee, off I went.

The first thing that struck me was the size of the venue. I suppose I shouldn't have been surprised. I was used to the old World of Amiga shows at the Darling Harbour Convention Centre in Sydney, but that was back in 1991-1993 when Amiga was still top of the heap. The Heritage Hotel - while still a very comfortable and inviting place to visit - was a much smaller affair. More like a wedding reception venue. Still, the WOA shows in Sydney boasted dozens of vendors and thousands of visitors. That was never going to be the case in 1999, and - as it turned out - the choice of venue ended up about right.

There were vendors present, and they are to be commended for (a) sticking with



the platform despite the obvious economic imperatives on the other side of the fence, and (b) making the commitment and the effort to leave their businesses behind for a few days (only one was from Canberra) to be a part of the show.

First cab off the rank as you walked in the door was **ComputaMagic**. I've known Vince Morton for many years, as my primary source of Amiga hardware and software in Melbourne. He is a wealth of information, a passionate Amiga advocate, and an active importer of many innovative Amiga products. He was selling a lot of Amiga software titles, hard disks, joysticks and other peripherals and had many bargains. He also had many secondhand or used items - I picked up an Amiga 4000 for an absolute song.

Next along the back wall was Phillip Eastham from **Amiga Genius** in Newcastle. He had lots of older game titles going for next to nothing, and also had quite a few hardware bargains - including CD-ROM drives and hard disks. I picked up a couple of items from Phillip, though the A2000 power supply didn't work when I took it home and installed it. A quick phone call and Phillip offered to exchange it for another - he'd even cover the cost of shipment! Try doing that at a PC show ...

**Unitech Electronics** also had a large stall, but that's probably just a reflection of the size of Jeff Rose's commitment to the platform. He's been a strong advocate of the Amiga since day one, and has even developed hardware upgrades from his small shop. Jeff and I have known each other for many years, and we now find ourselves on the **Amiga Advisory Council** together - the only two Australians on the board of thirty.

Jeff had lots of stuff to offer - including some bargain game titles from way back, many new titles, lots of hardware and peripherals, and the only new machines at the show (some A1200s that Petro must have been hiding away somewhere). Originally going for a song at just \$600, by the end of the show they were down to \$450!

Opposite Amiga Genius sat Greg Perry from **GPS Software**. They had Opus Magellan II for sale, and some very nice Opus t-shirts to match. A large-screen Amiga was set up to demo the software at their stall, and later, at the main stage area, Greg demonstrated the new version of Opus to an eager crowd. His stall was always crowded, and it looked like they were doing a good trade. The DirectoryOpus product has to be one of the few Australian Amiga success stories - certainly one of the few to have lasted so long.

Other vendors over the weekend included **Vaporware** (who were taking registrations for their products such as

**AmIRC** and **Voyager**), **Desktop Utilities** (the only Canberra company there) and **RMF**, who build and were selling one of the few stable Amiga Ethernet solutions around, the **Quicknet** card.

User groups were also well represented. Naturally the **Canberra Amiga User Society (CAUSE)** were well represented. In fact it was easy to spot them - they were all dressed in the same dark blue "Amiga Down Under 99" t-shirts.

Also there was the **Melbourne Amiga User Group** (MAUG - g'day Bill!) which I joined, the brand new **Australian Amiga Users Group** (ADUG - g'day Basil!) which I also joined, and the **Australian Amiga Developers Association** (AADA - g'day Jeff!) which I should have joined. The Amiga Education Network was also represented.

In fact ADUG was launched right then and there at the show, with President Steve Kennedy and Secretary Basil Flintler outlining the purpose of the group, urging people to join up, and presenting **Petro Tyschtschenko** with a certificate to pass on to Jim Collas recognizing Jim's patronage of the group.

Which brings me nicely to the two highlights of the show - the presence of Petro Tyschtschenko and Juergen Haage.

Petro should be well known to most Amigaphiles, helping to steer the Amiga ship through many of its worst storms. He remains a staunch supporter of the platform, and - in his position as Managing Director of Amiga International, the marketing arm of the international company - probably its best salesman. He had a bagful of goodies to give away, and was full of enthusiasm and encouragement. Not only was he there to open the show, he was also there to officially launch AmigaOS 3.5 - the first new Amiga operating system in five years.

**Juergen Haage**, Managing Director of the German company **Haage and Partner** - makers of quality Amiga software and hardware, including StormC, the Fusion Mac emulator, and ArtEffect - was there to assist with the launch of OS3.5 and to demonstrate it to an eager and salivating crowd. What we saw was called the "Australian prerelease version". Apparently it was not quite ready for the show, but they expect to be shipping in September.

With both Petro and Juergen travelling from Germany for the show, I felt ashamed to be complaining about a lousy thousand kilometer drive.

Two major door prizes - brand new Amiga 1200 Magic packs - were given out, one on Saturday and one on Sunday. Another was given away at the Saturday evening Trivia dinner, and a fourth to one lucky ADUG member. All were donated by Amiga International. Twenty lucky people were also given prerelease copies of AmigaOS3.5 on

each day. This was one of the biggest disappointments of the show - the fact that I didn't win one!!

There was much to impress with OS3.5 - things like breaking the 4Gb HDD barrier, full keyboard control over workbench, improved prefs editors, integrated internet connectivity, and more. I played around with the demo machine for quite a while after Juergen left, and no matter how hard I tried I couldn't break it.

To close the show on a light hearted note, we all wandered outside for a bash at a "Bill" penata. Some lucky raffle ticket winners were given a chance to swing the club, only to discover in the end that Bill's head is filled with popcorn and Amiga ephemera! Isn't irony a wonderful thing?!

Back in 1993 I remember walking away from one of the big Amiga shows in Darling Harbour wishing I'd had more money to spend and thinking, damn, these Amigas are good! Now, finally, I've walked away from a computer showing feeling the same. I wish I'd had more money to spend - not only because there were bargains there to be had, but to help to demonstrate my thanks to those vendors who have remained loyal to the Amiga platform.

And I did walk away thinking, damn these Amigas are good. That's in no small part due to Petro's boundless enthusiasm and positive attitude, to the demonstrations of AmigaOS3.5 by Juergen and OpusMagellan II by Greg Perry, and to the hundreds of people at the show demonstrating that - even though the technology is many years old - the Amiga is still capable of holding its own against the competition.

There are still quality products being developed for the Amiga - despite the fact that there has been no new technology since 1992. There are now things happening that may just see the name Amiga once again held up as the pinnacle of innovative computer technology. Attending Amiga Down Under 1999 helped me to feel that the Amiga wave - so long at low tide and receding - is now growing again, and even made me feel a part of it.

My congratulations to all the organizers for the sterling effort they put in to the show at great personal expense (I understand they each ended up several hundred dollars behind). The event was a credit to you and went a long way to keeping the momentum going in Australia.

To see pictures from *The Amiga Downunder Show 1999* as well as a longer edition of this article, please go to [www.Amiga.com](http://www.Amiga.com) or [www.pimpub.com](http://www.pimpub.com) for links to the site. Our thanks to Craig Delahoy for this article, who you can email directly at: [craigd@ansonic.com.au](mailto:craigd@ansonic.com.au).





# Sheepdog

## A few notes on the rest of the industry and a look at reasons to believe in the Transmeta VLIW chip for Amiga.

by Fleecy Moss

There isn't much news in the IT world this month worth serious consideration, so I will summarize it quickly and then move onto an in-depth discussion of VLIW processors. Given the amount of attention given in on-line discussions of Transmeta and VLIW as possible participants in our NG future, an explanation can only serve to remove the clouds.

First, the news. AMD finally released their new flagship processor, the K7, marketed as the Athlon. First impressions are of a very capable processor that beats a comparably clocked Pentium 3 in almost all areas. <http://www.gamespot.com> has a very nice set of observations and benchmarks.

Despite sacking their president, Bernie Stolar, Sega is on course for the 9.9.99 Dreamcast launch, with 300,000 presales, and a library of software and deals (among them AT&T for Internet connectivity) that continues to expand and impress. In response, both Nintendo and Sony cut the price of their existing consoles, and a report by Merrill Lynch hinted that PSX2 would be released in Japan on 23 January 2000, at a price of around \$370, suggesting that it is much more than just a gaming console.

Microwarez, infamous for the \$299 Webzter fiasco, have a new digital convergence product out, the \$199 non-windows iToaster, with a spiffy interface. They immediately got slapped with a couple of lawsuits from companies claiming they hadn't paid their bills. The road to the Digital Information revolution is a painful one indeed.

Amiga was featured in some nice articles on the Wall Street Journal and ZDnet, coinciding with other articles claiming that Microsoft is losing developers, and that Java/CORBA is starting to be in heavy demand as those products and their tool chains begin to mature. On top of this, a group of Red Hat wearing, hippy geeks from Raleigh, NC, managed to float their company and ended up being valued at five billion dollars. It looks like Linux is here to stay. All in all, the heady mixture of Java, CORBA, Linux, and the Amiga made

for some rampant speculation in the nonMicrosoft camp.

### But now to the serious stuff...

Transmeta having long been rumored to be the company behind the fabled MMC, and VLIW (Very Long Instruction Word) has long been associated with their product. Indeed, after 15 years or so on the unfavorable side of the tracks, VLIW seems to be making a comeback, with companies like the old Chromatics, Equator, and even Intel betting their next generation products upon it.

To understand VLIW, a very basic lesson in microprocessor design is required, so bear with me. I also hope my old friend Skipper Smith (ex of Motorola) isn't reading this and he'll probably pen me enough corrections to fill a small closet.

The basic unit of a CPU is called the Execution Unit or EU. Think of it as the checkout in a supermarket. All the work, in terms of customers with carts, is queued up behind the checkout, and it is processed one customer at a time, one item at a time.

Now obviously, the first way to improve this is to make the checkout operator work faster. The quicker he operates, the more work is done, and this is mirrored in the way CPU designers have concentrated on raising the speed of their processors.

An interesting aside is that speed is one of the primary reasons why RISC (Reduced Instruction Set Codes) triumphed over CISC (Complex Instruction Set Codes). CISC processors opted for loading, manipulating and then storing data in one instruction, a process which led to very complicated processors. RISC moved to a load/store model, in which the manipulation was kept to a bare minimum, leading to reduced complexity and size, and allowing clock rates to be boosted.

The second way to improve the checkout analogy is to add more checkouts. More checkouts mean more work done in the same amount of time. For processors, this means adding more execution units on

a single die, and this is called a superscalar architecture.

The biggest drawback to this process is the issue of dependency. The key to making a task run faster is to break it down into smaller tasks (this is called identifying the degree of parallelism in a task). If we have no dependency parallelism, then 1 task can be broken down into 7 subtasks and the 7 sub tasks can be run at the same time (assuming we have 7 free EUs).

However, if one of the tasks has a time dependency on another of the tasks or there is a data dependency, where both need access to the same piece of data, then complicated pre processing is required to extract the maximum level of parallelism from a task without breaking the integrity of the task itself. Mechanisms to do this include speculative execution, out of order execution, renaming, and reservation stations.

The third way to improve the checkout analogy is to break the checkout process down into subtasks. Instead of the checkout operator picking the item up, scanning it, sliding it down the ramp and then bagging it, why not provide a separate person for each of those subprocesses?

If we divide that single task into 3 subtasks (pick up and scan, slide, and pack), then for each time slice, 3 items are being processed, instead of 1. This is called pipelining the process, and such processors are called pipelined processors. As with the superscalar process, pipelining has to be wary of dependencies, and also of branching logic that fails, potentially causing pipeline stalls, in which all the instructions and data have to be flushed, and then new instructions reloaded.

With the exception of increasing the clock speed, all of these strategies rely upon increasing efficiency by exploiting parallelism in a task. Parallelism is broken down into two distinct types, functional and data.

Functional parallelism comes from breaking down a task into subtasks and managing the flow of those tasks. Data parallelism, on the other hand, relates to the



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ability of certain data structures (arrays, matrices, bitmaps, patterns) to expose elements at the same time.

Data parallelism is seen as regular, because it is predictable, whereas functional parallelism is seen as irregular, because even if a process flow can be decomposed, the degree of actual parallelism is dependent on the dynamic state of the operation itself (a person may use an application in a way that does not utilize the parallel subtasks, for instance, and a general session at any computer is often a random set of events - just observe what you do over ten minutes).

Exploitation of functional parallelism is available through the use of multiple CPUs with a multi-threaded OS and it really is still in its infancy, in terms of applicability. Data parallelism, on the other hand, is really taking off.

One of the classic architectures that encapsulates data parallelism is SIMD (Single Instruction Multiple Data), where a single instruction is applied to many data elements, usually for transforms or codecs. Indeed this is where such architectures realize their true potential, in graphics operations, decoding video and audio, and encryption.

That such operations are integral to the Digital Convergence market is no accident,

and it explains why such architectures are becoming a key part of the next generation CPUs, whether it be Intel's SSE (Streaming SIMD Extensions), AMD's 3DNow, or the PPC Altivec instruction set.

### So what is a VLIW processor?

A VLIW CPU is very similar to a superscalar, pipelined processor. The main differences are in how instructions are delivered to the EUs and in how scheduling is performed (scheduling is the process of deciding which instructions—and data—will be processed next by which EUs).

In a normal superscalar processor, instruction delivery (or issuing) is a sequential process, irrespective of the number of EUs. This results in a single point of entry (giving control) but often leaves EUs waiting around for instructions, since only one is issued at a time.

VLIW takes instructions for each of the EUs and places them into a Very Long Instruction Word, that contains entries for each of the EUs. The length of the actual VLIW is dependent obviously on the number of EUs and on the length of the control field for each of them (since floating point could be mixed up with integer), but it can range between 100 bits to over a kilobit.

The difference in scheduling is that conventional superscalar processors are scheduled dynamically (there is hardware embedded into the chip that searches for dependencies and orders scheduling at run time), whereas VLIW processors are scheduled statically. In effect, this means that the instructions have already been analyzed for dependencies and have been optimized and packed before they are plucked from memory and delivered to the processor. This is done by the compiler.

The advantages of this are obvious. By removing the processes of decoding, data dependency analysis, instruction scheduling and issue, renaming, shelving and reordering from the processor, you reduce complexity considerably, and as I explained above with RISC, a simplified processor can be made a much faster processor, which means much more work can be done.

The disadvantages are less obvious, but more worrying, which explains why VLIW has had such a hard time becoming a dominant architecture for general purpose processors.

First, because much of the complex dependency, parallel analysis and processing is moved to the compiler, the compiler becomes a much more complicated beast. Even worse, to be able to do such analysis



requires that the compiler knows about the target processor at a very low level, information about each EU, its latencies, repetition rates, memory load and store times, cache hit/miss/flush/fill statistics, etc.

Unfortunately, a lot of this information is only available at run time and is dependent on exactly what is being run on the processor at that time. To get around this, VLIW compilers need to build complicated sets of statistics and usage models, and then apply them blindly to a runtime environment.

Once the compiler sets the instructions, reality is not allowed to impinge on the flow. This close link between the compiler and the low level microarchitecture of the processor means that any changes to a processor, for instance in a next revision, renders the compiler and compiled code useless.

Second, a full VLIW must be passed to the processor all the time, with an entry for each EU, irrespective of whether the parallelism analysis has been able to provide instructions for all those EUs in that cycle. This means that the VLIWS often have to be padded with NOP (No Operation) instructions for those EUs which don't have an instruction for that cycle. This leads to wasted space, larger object code, and wasted memory transfers.

Third, the complexity of such a processor would make it virtually impossible for a developer to work in assembly language. Trying to juggle the number of EUs, parallel threads and dependency checking in a single human brain would probably turn it into sushi. Access to the processor would most likely be restricted to a source level language supported by a compiler, and the complexity of that compiler would restrict the number of compilers supporting the processor.

Perhaps more importantly, the key issue is how can the advantages of the VLIW processor (more EUs, faster clock speed) be exploited against a typical application set work load? As I explained above, exploiting data parallelism is relatively simply and provides rich returns, whereas functional parallelism is a far more tricky beast, and is perhaps best exploited at the application design level.

A VLIW processor as the single processor in a general purpose device only makes sense for a set top box or WebTV, where most of the task load is encryption and decryption. But, for a device that plans to do more, it is perhaps best as a supporting processor, as a dual or combined architecture device. Indeed, the Equator chip is designed in this manner, with both a VLIW core and a standard superscaler core surrounding a custom memory handler, needed to support both the sequential issuing superscalar and the instruction hungry VLIW core.

### Where is Amiga?

So where does this leave the Transmeta offering? Well, since information is scarce, or on a "don't tell anyone or I'm fired" basis, we have to speculate based upon what is publicly available and rumored. It may turn out not to be VLIW, in which case the above is just interesting to read but irrelevant to the Amiga's future.

We do know that it is supposed to be able to mimic other instruction sets, in other words, translate PPC, x86, Java bytecode, or even 68k into its own native instructions and run them. This is nothing new, AMD has been doing this for years, decoding x86 into its own RISC set. But, the ability to do it for multiple instruction sets suggests a soft loading ability: download the instruction set of your choice and then execute the code.

Since this could be seen as a glorified codec, perhaps this is where the VLIW architecture would make sense. Although, how a static dependency architecture can optimize a dynamic dependency architecture remains to be seen. It will make for an interesting read if the information ever comes out.

•AC•

# Paint It on the Wall!

## Keeping graffiti on the screen and off the streets!

by Nick Cook

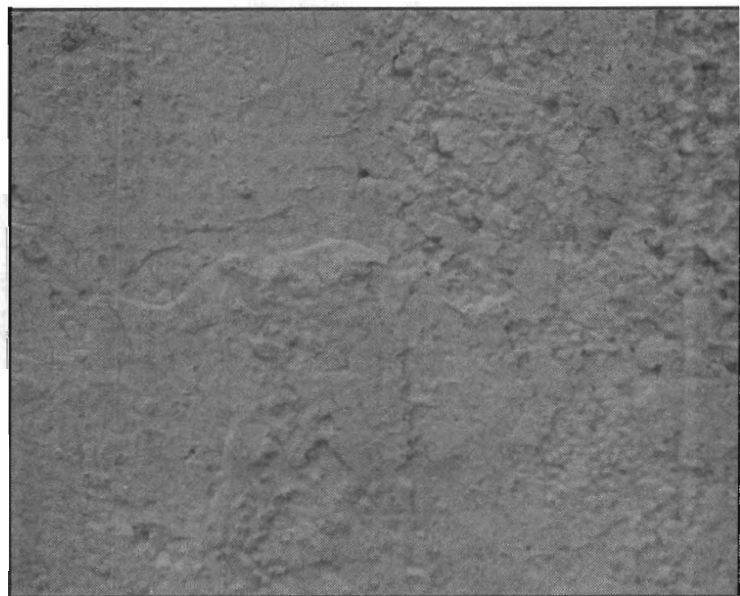


Figure 1: Pick an image with texture that is almost monochromatic.



Figure 2: The light and dark greys in this layer serve as a map through which the type will pass.



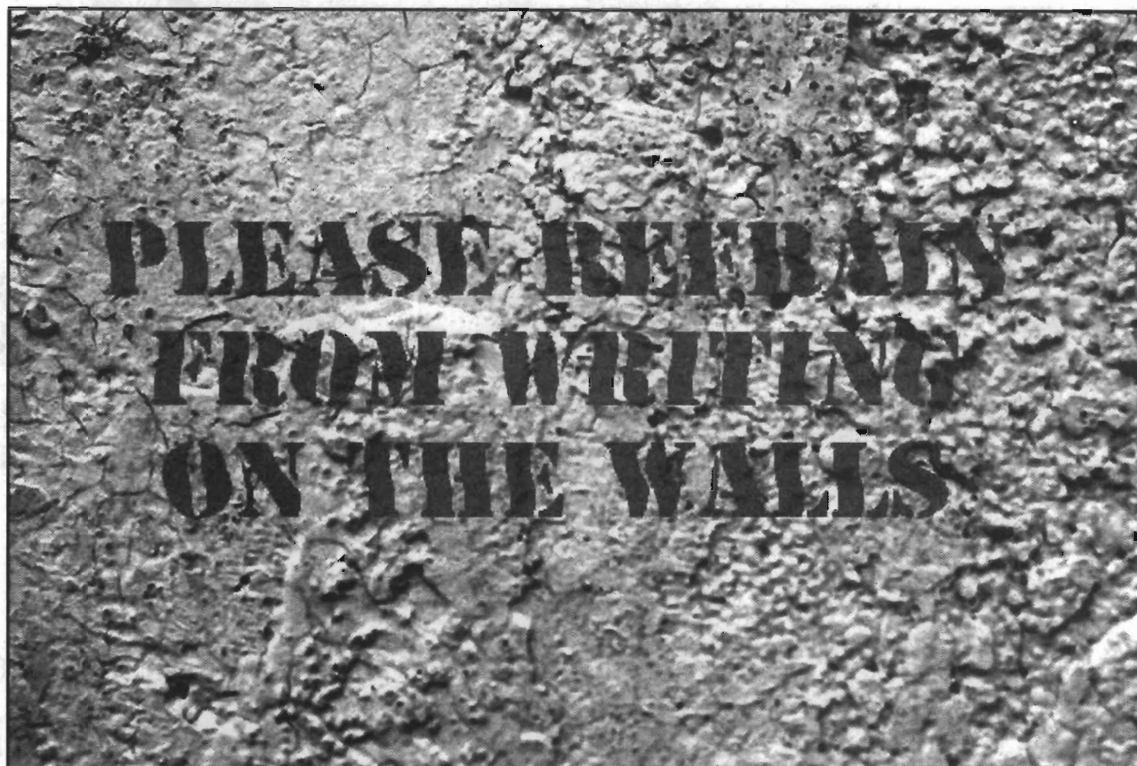


Figure 4. Your final result may vary, but you will not get a ticket for graffiti.

I once appeared in a theatrical production where the director became exasperated at another actor. Said actor always responded "yes, but—" to whatever the director said. Finally, the director exploded: "I'll paint it on the wall if you want me to!"

Yeah, OK. Let's paint it on the wall. The technique uses information from a background image to control the texture of type "painted" on top. This image recreates a sign I spotted on the top of Capetown, South Africa's, Table Mountain.

### Fire ImageFX 3 and let's go.

**STEP ONE:** Load your wall. You want an image with texture that is almost monochromatic. We'll use this image both as the background and as an alpha channel mask to control the texture effect (Figure 1).

**STEP TWO:** Click on the Layer button, and Select New Layer from Buffer. When the requester appears, pick the wall image from Step One. In other words, your second layer is a copy of the first.

**STEP THREE:** Add a touch of Roughness (in the Effects menu) to the image in the second layer. A setting of 10 was used here.

**STEP THREE:** Convert the second layer image to greyscale with the command in the Color panel. The light and dark greys in this layer serve as a map through which the type will pass. The type will show through the lighter areas, but the background image will show through the darker areas. Call up the Balance panel. Slide the Value control down (-50 in this example), and the Contrast one up (+50, for no other reason than symmetry). Figure 2 is the result. Double click on the layer name in the Layer Manager, and check Mask Layer.

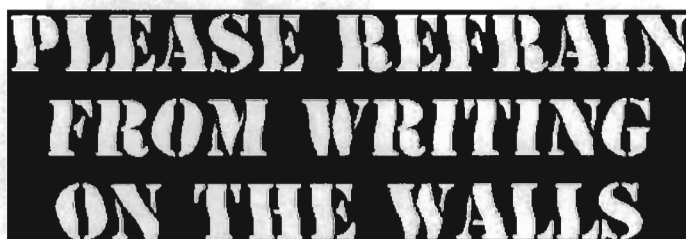


Figure 3. Walls aren't that smooth, so painted letters distort a bit.

**STEP FOUR:** Create another layer. Be sure this layer is grey scale as well (check the little box on top of the interface), or the compositing may become strange. Pick white as the draw color, and use the Text button to add your verbiage.

**STEP FIVE:** Many walls, such as ours, aren't that smooth, so painted letters distort a bit. Click on the Distort, then select the Dream effect. You don't want a large amount of waviness, just a touch. I used a setting of two Waves with an Amount of 10 (Figure 3).

**STEP SIX:** As you did in Step Three, make your text layer a Mask Layer.

**STEP SEVEN:** As they said in vaudeville, "Once more with feeling!" Create yet another, but your last, layer. Fill it with the color you want for the text.

**STEP EIGHT:** Select Flatten from the Layers Manager's menu.

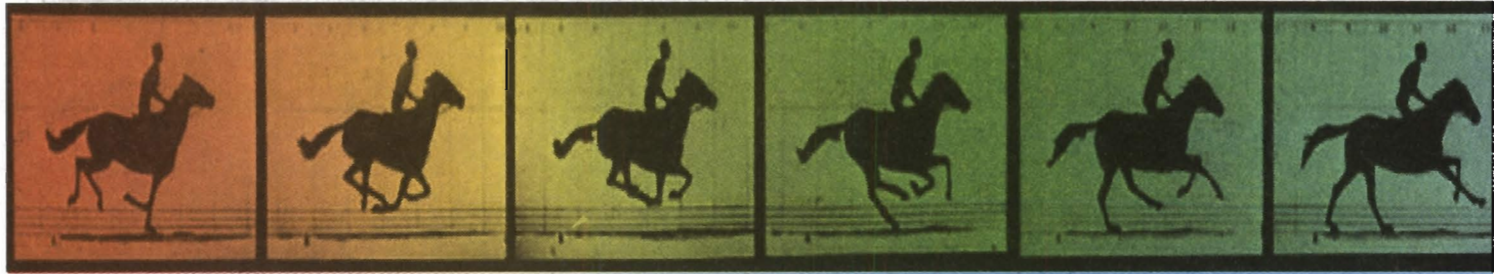
You can add touches, such as dripping or smudged paint, to the text layer.

•AC•

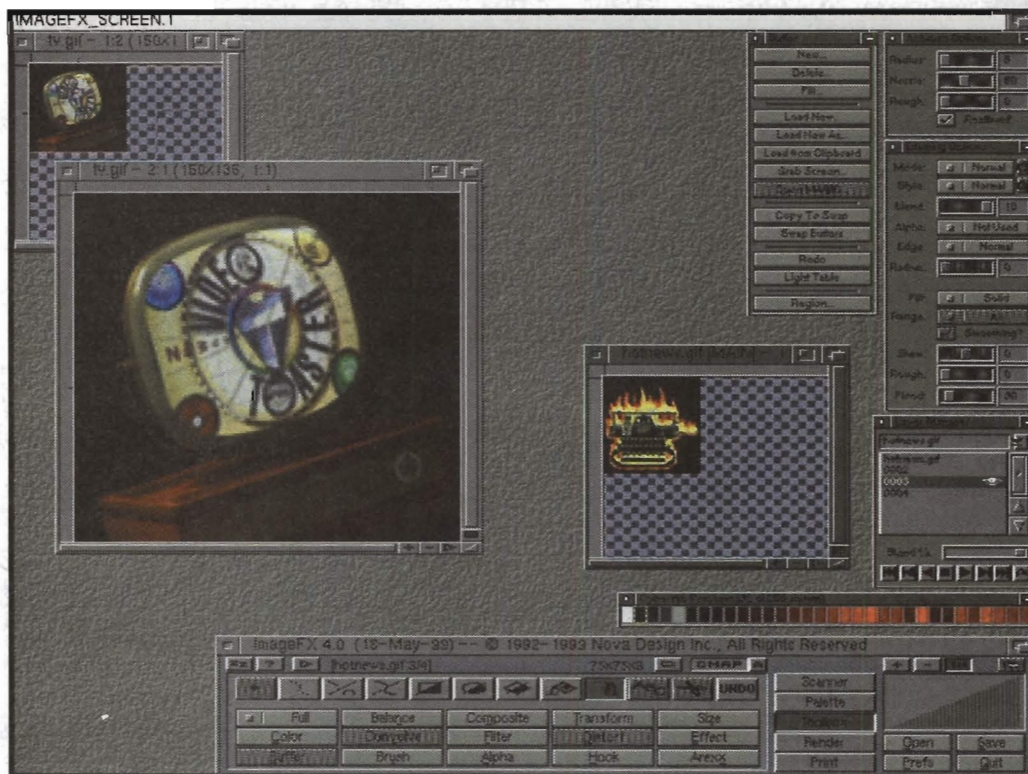
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Nova Design, Inc. has built on the new windowed interface introduced in ImageFX 3.x and has added controls to directly manipulate animations within ImageFX. On screen VCR-style controls have been added to the layering system to allow you to move within the frames of an animation or even playback the animation in your preview window. Brushes can be animated across a series of frames and effects can be automatically processed across frames as well!

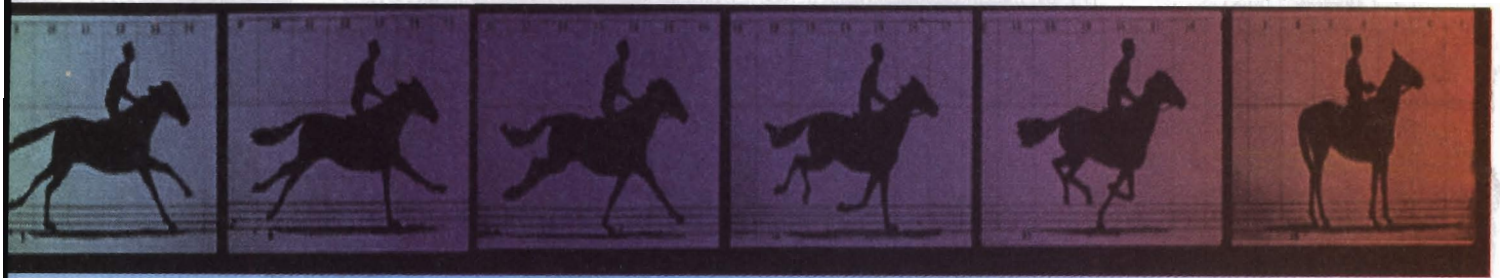
These controls make it easy to edit animations for use on the Internet on your own web pages. You can create hand drawn animations, brush animations and you can easily rotoscope video sequences, add effects, and batch process. If you want to modify web animations, it's as easy as loading now that you can load animations. Full support for loading and saving entire or partial FlyerClips is included for Amiga Toaster/Flyer owners.



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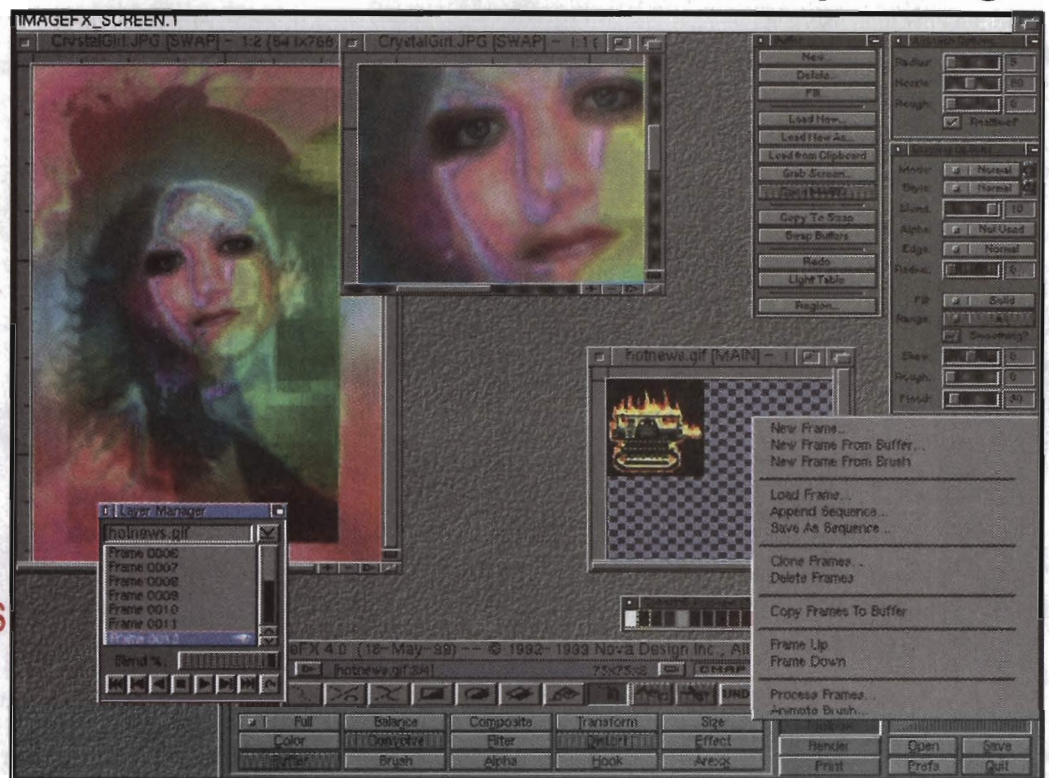
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- Builds Web Animations



ImageFX now comes on CDROM for it's standard distribution. If you don't have a CDROM drive (and you should, they're pretty inexpensive now) ImageFX will ship with a coupon to order a copy on floppies. As a bonus the CDROM has sequences of images, animations, and nearly the entire contents of our Internet site as well!

If you own a version of ImageFX prior to version 2.0 your upgrade price is now \$149.95. ImageFX 2.x owners can upgrade for only \$99.95. ImageFX 3.x owners can upgrade to ImageFX 4 for only \$79.95. All upgrades include the necessary hardcopy documentation or upgrade documentation and CDROM. You can order via 1-800-IMAGE-69 in the US and Canada or call (804) 282-1157 elsewhere. Orders can also be faxed to (804) 282-3768 or mailed to our address.

ImageFX is also available, *new*, through your local Amiga dealer or via mail order at a suggested retail price of \$349.95.





## Part 3: Completing your script!

by Bohdan Lechnowsky

Let's return to the REBOL script started in the last installment and get it to a point where it will be a useful tool for the user to play with and modify.

Since the last installment, REBOL/core is now in version 2.0.4 and available on 22 different platforms with more planned including AmigaOS 1.3 68000/010 and AmigaPPC versions.

While testing the script, I noticed in the find-links function that the check of "mailto:" was outside of the "while" loop. This will not work the expected way because it will only check the links after the while loop is exited (therefore only checking the last link instead of all the links).

This correction in mind, the script from the last installment should now look like this:

```
REBOL [
  Title: "REBOL Web Miner"
  Date: 8-Mar-1999
  Author: "Bohdan Lechnowsky"
  File: %rwm.r
  Email: bo@rebol.com
  Purpose: {
    To extract links from our favorite web pages
  }
]

find-links: func ["Finds 'href' links and outputs them as a
block"

  html [string!] "The HTML text to parse"[
    links: make block! 0
    while [found? html: find html "href"] [
      link: (trim (copy/part (next (find html "="))
        (html: find html ">"))))
      if not found? find link "mailto:" [
        append links make url! trim/with link "^"
      ]
    ]
  ]
  return links
]

urls: [
  http://www.rebol.com/
  http://www.cucug.org/aminew.html
  http://www.pimpub.com/
]

newlinks: make block! 0
foreach url urls [
  append newlinks url
  append newlinks find-links read url
]

html-header: [
  {<HTML><HEAD><TITLE>New Links</TITLE></HEAD>
  <CENTER><H1>New Links</H1>
  <H2>Generated by the REBOL Messaging Language</H2>
  <H3>} now {</H3></CENTER>
  <HR>
  }
]
```

```
html-output: to-string reduce html-header
if exists? oldlistfile: to-file reduce [what-dir "oldlist.r"] [
  oldlist: load oldlistfile
]
```

REBOL/core supports a datatype called "tag" that recognizes HTML tags. This makes it possible to combine the html-header and html-output lines together and convert to use the tag datatype in the following manner:

```
html-header: reduce [
  <HTML><HEAD><TITLE>"New Links"</TITLE></HEAD>
  <CENTER><H1>"New Links"</H1>
  <H2>"Generated by the REBOL Messaging Lan-
guage"</H2>
  <H3>now</H3></CENTER>
  <HR>
]
```

The html-output line can now be removed.

A blank oldlist needs to be created if the oldlist doesn't already exist on the hard drive. This should only occur the first time the script is run or if the oldlist file is not present in the same directory as the script. This can be done in at least two ways. The first (and easiest) way is to add a line before loading the oldlist file that initializes oldlist to an empty block. The second way is to use "either" instead of "if" where oldlist is allocated to an empty block only if the oldlist file isn't found in the current directory. Here's how to do it the first way:

```
oldlist: make block! 100
```

This preallocates room for 100 items in the block. This is not necessary, but reduces the amount of work the interpreter has to do when the block starts having items inserted into it. This line should be added above the "if exists?" line.

One last change is needed before starting on the main processing loop that will build the index web page of new links for each site. To determine which of the links in the "newlinks" list are the checked sites, these links will be made into a string instead of leaving them as a URL. The reason for this will become more evident later. To do this, change the following line:

```
append newlinks url
```

to:

```
append newlinks form url
```

"Form" tells the interpreter to make whatever datatype follows it into a string.

Now for the main processing loop:

```
foreach link newlinks [
  either string? link [
    site: tail copy link
    while [(copy/part site: back site 1) <>
"/"] [
      site: to-url head clear next site
```

### About the author:

Bohdan "Bo" Lechnowsky is Quality Assurance Coordinator for REBOL Technologies 707-467-8000 (<http://www.rebol.com>)  
Just a reminder, you can Download the REBOL Messaging Language for all Platforms -FREE-

```

        append html-header reduce [
            <P><H2>{<A HREF="} link {">} link</
A></H2> newline
    ]
    ][
        if none? find oldlist link [
            if (copy/part link 7) <> http:// [
                link: head clean-path join site
link
            ]
            append html-header reduce [
                {<A HREF="} link {">} link</
A><BR> newline
            ]
        ]
    ]
]

```

The "foreach" function will take each link out of newlinks one-by-one until all the links are processed. This will allow processing of each individual link. Next, the script should check to see if the current link is a string. If it is, this means it was the site that was checked and a different line of HTML code should be output to the html-header block.

If this is the site that was checked, find the parent of the current directory so it can be prepended to all relative links found from this site, thereby making absolute links. This is accomplished by setting a new word "site" to the end of the current link and working backwards until a "/" is found. The line that sets "site" to the tail of "link" also makes a copy of "link" so it won't change the value of "link" itself.

The "while" loop here is a little tricky (and neat) as it doesn't have anything in the body. In this case, it is used to move the index of the string back until the first character at the index is a "/". Each time through the while loop, the index of "site" is moved back one space, then the first character at that index is copied (with "copy/part ... 1") so it can be compared with a "/". Incidentally, the same functionality can be done with an "until" loop written like this:

```
until [(copy/part site: back site 1) = "/"]
```

This is left to personal preference. Once the last slash is found, the index is moved to the next character after the slash and then the rest of the string is cleared. The index is then moved to the beginning (using "head") and the whole thing is made into a URL with to-url.

Now that the root of the current site is known, this site should be appended to html-header as the heading for this site. This is done with the "append html-header reduce [...]" line.

This is the end of the block that is evaluated if "link" is a string. If "link" is not a string (it is a link found in the current "site"), the second block of the "either" statement is performed.

First, a check is made to see if the link was found the last time the script was run. This is done by doing a "find" on "oldlist". If it is not found in the oldlist, it is a new link and should be added to our index page.

The next line checks to see if the first 7 characters of the link are equal to "http://". If not, the script assumes this is a relative link and will prepend the current site to the relative link. "Join site link" joins "site" and "link" together into a single URL. "Clean-path" will remove all ".." sequences from the URL in the proper way so relative links that move up in the current path will be correct. For instance, if "site" equals "http://www.site.com/downloads/" and "link" equals "../about.html", they will look like this when joined:

```
http://www.site.com/downloads/../about.html
```

and it will look like this after "clean-path" has been applied:

```
http://www.site.com/about.html
```

The absolute link will now be added to our html-header block with the "append html-header reduce [...]" line.

The either statement and the foreach loop are then exited after all the links have been processed. Because proper HTML demands that pages are closed with </HTML>, this tag is appended to the html-header block with the following line:

```
append html-header </HTML>
```

Now that html-header contains the complete HTML page, it is time to write it out to a file. For this example, it can be called %newlinks.html and can be saved to the current directory with the following line:

```
write %newlinks.html html-header
```

The next time the script is run, we want the current list of links "newlinks" to be the list checked against. The following line will perform this:

```
write oldlistfile newlinks
```

One last enhancement: Because the retrieval of a particular page is not guaranteed, the interpreter's error-catching mechanism can be used to ensure that the script can run through to completion even if a particular site cannot be accessed. This can be done by the following change to the first foreach statement in the script:

```

foreach url urls [
    append newlinks form url
    either not error? try [read-url: read url] [
        append newlinks find-links read-url
    ] [
        print ["Error reading" url]
    ]
]

```

"Try" is a function that will attempt to process whatever is in the block following it. If it is an error, it will return an error datatype that can be checked by "error?". Therefore, if the URL was readable the try will not return an error datatype and "error?" will return "false".

That's it! A relatively complicated solution has been written in a relatively compact script! The user can now make personalizations and add features and functionality using this script as a base.

This is what my completed script looks like:

```

REBOL [
    Title:    "REBOL Web Miner"
    Date:     8-Mar-1999
    Author:   "Bohdan Lechnowsky"
    File:     %rwm.r
    Email:    bo@rebol.com
    Purpose: {
        To extract links from our favorite web
pages and make only
        the new links into an index web page.
    }
]
find-links: func ["Finds 'href' links and outputs
them as a block"]

```



```

        html [string!] "The HTML text to parse"[
links: make block! 0
while [found? html: find html "href"] [
    link: (trim (copy/part (next (find html "="))
        (html: find html ">")))
    if not found? find link "mailto:" [
        append links to-url trim/with link {}
    ]
]
return links
]
urls: [
    http://www.rebol.com/
    http://www.cucug.org/aminew.html
    http://www.pimpub.com/
]
newlinks: make block! 0
foreach url urls [
    append newlinks form url
    either not error? try [read-url: read url] [
        append newlinks find-links read-url
    ] [
        print ["Error reading" url]
    ]
]
print "Done reading pages..."
html-header: reduce [
    <HTML><HEAD><TITLE>"New Links"</TITLE></HEAD>
    <CENTER><H1>"New Links"</H1>
    <H2>"Generated by the REBOL Messaging Language"</H2>
    <H3>now</H3></CENTER>
    <HR>
]
either exists? oldlistfile: join what-dir "oldlist.r" [
    oldlist: load oldlistfile
] [
    oldlist: copy []
]
print "Processing links..."
foreach link newlinks [
    either string? link [
        site: tail copy link
        while [(copy/part site: back site 1) <> "/"][
            site: to-url head clear next site
            append html-header reduce [
                <P><H2><A HREF="> link {"> link</A></H2> newline
            ]
        ] [
            if none? find oldlist link [
                if (copy/part link 7) <> http:// [
                    link: head clean-path join site link
                ]
                append html-header reduce [
                    <A HREF="> link {"> link</A><BR> newline
                ]
            ]
        ]
    ]
    append html-header reduce [newline </HTML>]
    write %newlinks.html html-header
    write oldlistfile newlinks
]

```

I hope the reader has enjoyed this voyage into one of the huge number of applications for which REBOL/core v2.0 can be used. An excellent advantage of writing this script in REBOL is that it can be run on anything from the user's Amiga to a friend's Windows machine to the school's Mac PPC and others without any changes.

Thanks again to Danny Ramsey for pre-editing this article. Check out <http://www.rebol.com> for the latest free version to download, dozens of example scripts, documentation, and information on this wonderful and powerful scripting language!

**Please Note:** Although we have tried to represent the code in this example perfectly, some lines may have wrapped to the next line. For a look at the code directly, please see the file on our site at [www.pimpub.com](http://www.pimpub.com)

•AC•

# Unix Networking Networks and Internetwork

by Antonello De Santis

## Introduction to Computer Networks.

What is the basic idea of networking? Long distances become short if you cooperate with your neighbors. Let me explain this concept better.

Suppose you and your friends have bought a lot of food to have a great party at your house. When you are about to bring everything upstairs, your home is on the second floor, you discover the elevator is out of order. What are your options?

Everyone may carry a bag upstairs, but this can take long since maybe there are many bags and so you have to go back downstairs several times. There is a smarter option. You can create a human chain. Everyone takes a place on the stairs as close as possible to another friend. Now the friend on the ground floor takes the first bag and passes it to the next friend, who passes it to the friend next to him and so on, until the bag gets to the second floor. This operation is repeated again as soon as the second friend in the chain has passed the bag to the third one, now the first friend can take another bag and pass it to the friend next to him, and so on till every bag is delivered to the second floor. In this way you can accomplish in five minutes an operation that could have taken half an hour.

This example is exactly like the basic concept of networking. If you have a computer in Paris connected to two computers, one in Rome and another one in London, and you want to send a message from Rome to London, you don't need to connect the computers in Rome and London directly, you simply have to ask the one in Paris to please forward your message to London.

Last generation Unix-like operating systems have been developed with this concept in mind. They are, in fact, perfectly suited to create very powerful and efficient computer networks.

Computer networks can be made up of machines produced by different manufacturers and even with totally different

hardware and architecture. This is the power of computer networks. Machines can communicate with each other even if they internally work in totally different ways.

It is as if two people, one talking Latin and the other talking Greek, tried to talk to each other! How would you help them have a useful conversation? Teach both of them a common language, such as English.

This is the expedient used to allow hardware incompatible computers to communicate. They are "taught" a common language, called "protocol". Computer scientists have developed many different protocols, but we will only examine computer networks based on the most common one: the TCP/IP (Transfer Control Protocol/Internet Protocol). The Internet is based on the TCP/IP protocol.

## Terminology.

Let's clarify the concept of protocol. We have said it can be considered as a common language that can be "spoken" by machines with different kinds of architecture. A more specific definition of protocol is the following: "A protocol is an agreement between the communicating computers on how communication has to proceed".

Protocols are made up of several high level data structures that abstract from the hardware of the machine on which they are running. Communication is accomplished by delivering packets of bits through the network. These packets of bits are interpreted by the computers in the network, according to the specifications assumed in the protocol.

So, for example, the first bits can be interpreted as the address of the machine that is going to receive the packet, other bits as the address of the sending machine, still other bits are the significant bits of the packet (for example a little part of a big file that is being transferred), and even more bits can be used as control bits to check whether the transfer has taken place without errors or not. The rules on how to interpret the bits in the packet are specified by the network protocol being used.

I won't go into more depth with the explanation on how network protocols are technically realized. This topic would lie beyond the aim of examining how Unix computer networks are created. If you are particularly interested in this topic, I advise a book that is considered the bible of computer networks: *Computer Networks - Third edition*, written by Andrew S. Tanenbaum and published by Prentice Hall.

## Three Networks

There are three main kinds of computer networks: Local Area Networks (LAN), Metropolitan Area Networks (MAN) and Wide Area Networks (WAN).

Local area networks are small private networks, where I have used the word "small" to describe a computer network inside a building or a campus of up to a few kilometers.

Metropolitan area networks cover a group of buildings in the same city, so they are much bigger than LANs, but not too big yet.

Wide area networks are very large networks covering an extended geographical area, such as a country or a whole continent.

Networks are made up of several (eventually thousands) of computers. Every computer that belongs to a network is called a "host". Every host is assigned a unique address in order to be univocally identified in the network.

Not only single computers can communicate with each other, entire different computer networks can as well. Suppose that in a university there are two different computer networks, one for the faculty of Physics and one for the faculty of Math. Sometimes it may be necessary to transfer some data from the network of Physics to

the one of Math or vice versa. This operation wouldn't usually be possible, because the two networks aren't physically connected, but there is a solution for this situation too.

When a computer network is projected, before its implementation, the technician always asks if the network is going to be connected to other networks sometime in the future. If the answer is yes, then the network is set up in a different way: an extra machine is added, called a "gateway" or "router", whose job it is to forward the packets coming from its own network to the gateway of another external network.

So, in the example of the two university networks, we would have two gateways directly connected, one in the network of Physics and one in the network of Math. Every packet that has to be delivered from Physics to Math, or vice versa, is firstly sent to the gateway of the local network, that will send it to the gateway of the network of the destination machine, that will finally forward it to the destination machine.

This operation is totally transparent and the user doesn't notice at all that the packet he has sent has been forwarded to several machines before getting to its destination. With this technique, called "internetworking", several different networks appear like a unique homogeneous network, called "internetwork" or simply "internet".

Notice the subtle difference between an "internet" and the "Internet". The Internet that we all know and use is a world wide "internetwork" or "internet", that's been given "Internet" as its name. "Internet" is just the official name that has been given to this particular internetwork.

You can obviously connect more than just two networks. As you'll have surely thought, there's no need to connect every router of every network to each other, it's enough connecting every gateway in a chain so that every packet can be delivered to every possible destination, "asking" a gateway to please forward the packet to another gateway and so on, until the packet gets to the desired network. A gateway is usually connected to more than just one network, in order to make packet delivery as fast as possible.

Every gateway has a particular configuration file called a "routing table", where is specified every network to which the gateway is connected. So when a host in the local network has to send a packet to an external network, it first sends it to the local router. Then the router checks its routing table to see if the gateway of the destination network of the packet is directly connected to it. If it is, then the packet is sent to the router of the destination network that will forward it to the right local host. If instead, the router of the destination network is not directly connected to the local gateway, the routing table will be checked to find the closest gateway that is connected to the gateway of the destination network.

It is possible that the destination network is very far and so the packet has to be passed to several, eventually hundreds of routers before getting to the right network. Every router would check its own routing table to see which is the best "direction" in which to forward the packet, in order to get it to its destination as fast as possible.

## Conclusions.

As you can see, the structure of computer networks or internetworks is a very complex one. Examining Unix networking capabilities, will give you an idea of how the Internet works and what are the infinite possibilities and advantages that a well implemented network can give to every user. The world of computer networks is really fascinating and incredibly interesting!

Next month we'll start examining the material that is needed to realize a network and the basics of TCP/IP protocol.



# ImageFX Tutorial: Part 2

## Peeking Inside AutoFX

A look inside the magic box.

By Dave Matthews

This time, we're going to open the magic box and look inside. **Warning, computer programming ahead!** While ARexx scripts (the language by which AutoFX performs its magic) are reasonably straight forward, if you shudder at the mere thought of looking at source code, then you probably won't like this article.

The easiest way to get into ARexx programming for ImageFX is to study other people's scripts. ImageFX comes with about a million scripts for many effects, so be sure and look them over before you plunge into programming from scratch.

OK, as you remember from last time, AutoFX is ImageFX's new visual batch processor system. Batch operations are built by adding images and ARexx commands via the interface, which then creates and executes these scripts, using the list of images you provided.

Actually, many of these AutoFX scripts are composed of three separate files. The command itself, and command.pre and command.post siblings. The .pre file is used for setting up things before you begin the actual command, and the .post is for cleaning up afterward. More on these later.

Remember from last issue, Figure 1. This shows the list of filenames in the upper right window, and the list of commands in the lower right. Let's take a closer look at those commands. The first command, Load.ifx, is listed below (you can load this into a text editor if you like, it lives in the ImageFX3:Rexx/Autofx drawer. Just be sure not to accidentally change it.

```
/*
 * $VER: Load.ifx 2.6 (24.04.96)
 * Copyright © 1992-1996 Nova Design, Inc.
 * Originally written by Steve Tibbett
 * Updated by Thomas Krehbiel
 *
 * Loads main, swap, and alpha buffers. Only loads
the images if
 * they are specified.
 *
 * Inputs:
 * Word(Arg(1),1) = Frame number (1 - N)
 * Word(Arg(1),2) = Main filename ("- " if not
```

```
specified)
 * Word(Arg(1),3) = Swap filename ("- " if not
specified)
 * Word(Arg(1),4) = Sequence number (?)
 * Word(Arg(1),5) = Total number of frames (N)
 * Word(Arg(1),6) = Alpha filename ("- " if not
specified) [2.6]
 *
 * Returns:
 * 0 if successful, non-zero on failure
 */
```

### OPTIONS RESULTS

```
/*
 * AutoFX 2.6 now sets some clip variables. If we
find them, use them instead
 * of the arg strings so that we can handle
filenames with spaces in them.
 */
```

```
MainName = GETCLIP('AUTOFX_MAIN')
IF MainName = "" THEN MainName=word(Arg(1),2)

SwapName = GETCLIP('AUTOFX_SWAP')
IF SwapName = "" THEN SwapName=word(Arg(1),3)
```

```
AlfName = GETCLIP('AUTOFX_ALPHA')
IF AlfName = "" THEN AlfName=word(Arg(1),6)
```

```
LoadBuffer Force ""MainName""
IF rc ~= 0 THEN EXIT rc
```

```
IF (SwapName ~= "- ") THEN DO
    Swap
    LoadBuffer Force ""SwapName""
    IF rc ~= 0 THEN EXIT rc
    Swap
    END
```

```
IF (AlfName ~= "- ") /*&& (AlfName ~= "")*/ THEN DO
    LoadAlpha ""AlfName"" Force
```

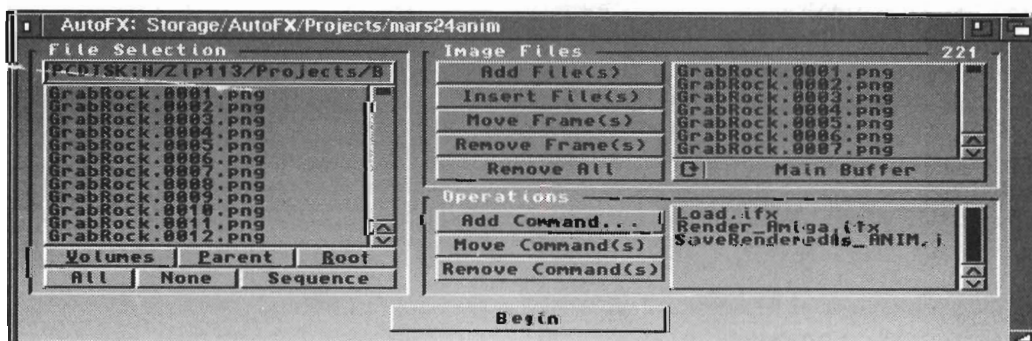


Figure 1: Our batch script in AutoFX

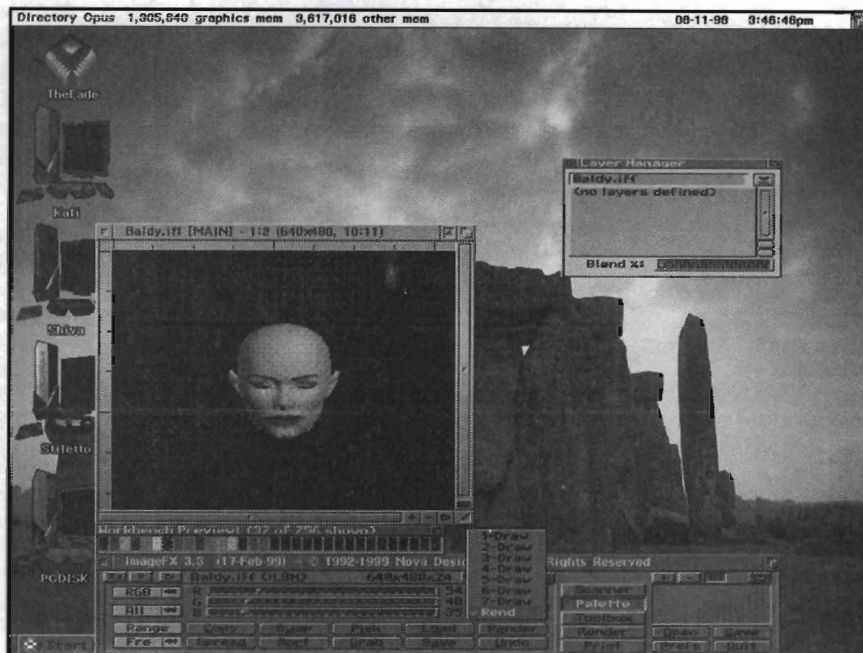


Figure 2: Saving the Render Palette

```
IF rc ~= 0 THEN EXIT rc
END

EXIT 0

/* End Load.iff
_____*/
```

The Load command causes ImageFX to load a picture into the main buffer. If they are specified, pictures will be loaded into the Swap buffer and the Alpha channel as well. While the above script, the insides of the Load command, looks complicated, it's really not. There are only a few things we need to worry about.

First, everything between /\* and \*/ is a comment, just some notes about the script, who wrote it, what it does, etc. These lines don't affect the program, but are there for humans to read. Always start your ARexx script with a comment line. This is good Karma, and anyway, ARexx won't run the script without it.

The OPTIONS RESULTS line is important if you want useful results from your ARexx program. This will allow values and the results of calculations and such to be used by the scripts and sent to ImageFX to act on.

The next group of commands are more interesting. Look at the line that starts at:

```
MainName = GETCLIP('AUTOFX_MAIN')
```

Here is where the names that you added to the AutoFX GUI are collected, one at a time. MainName holds the name of the file meant for the main buffer, SwapName for the swap buffer and the whimsical AlfName holds the Alpha Channel filename.

The next line is the heart of the matter:

```
LoadBuffer Force ""MainName""
```

This command hands ImageFX a filename, with instructions to "Load this Picture". The word Force tells ImageFX not to pop up a requester asking us if we're really, really sure we want to do this thing? Notice the single and double quote marks? When the script sends ImageFX the filename, it encloses it in double quotes, so ImageFX can handle a filename with a space in it. But double

quotes have meaning to ARexx, so you need to enclose the double quotes with single quotes to let ARexx know these double quotes are to be sent out as is, not internally operated on.

Notice the following line:

```
IF rc ~= 0 THEN EXIT rc
```

This line checks the result code of loading the image. If something bad happened, file not found, corrupt image, or what have you, ARexx sets the rc variable to a non zero value. The above line checks the rc value and if it's not zero, something went wrong and Autofx gives up.

The rest of the lines ask if the swap and Alpha channel exists, and if so, loads them into the appropriate buffer. If all went well, then the final line:

```
EXIT 0
```

tells AutoFX this command is finished, and we're ready to go on to the next one, which is:

```
/* Begin Render_Amiga.iff
_____*/
```

```
/*
 * Render_Amiga.iff
 * Written by Thomas Krehbiel
 *
 * Render to an Amiga display format.
 *
 * Inputs:
 *   Word(Arg(1),1) = Frame number (1 - N)
 *   Word(Arg(1),2) = Main filename ("- " if not
specified)
 *   Word(Arg(1),3) = Swap filename ("- " if not
specified)
 *   Word(Arg(1),4) = Sequence number
 *   Word(Arg(1),5) = Total number of frames (N)
 *
 * Returns:
 *   0 if successful, non-zero on failure
 *
 */
```



## OPTIONS RESULTS

```
base = 'Autofx_RendAmiga_'

lockpal = GETCLIP(base||'LockPal')

framenum = Word(Arg(1),1)
mainname = Word(Arg(1),2)
swapname = Word(Arg(1),3)
seqnum = Word(Arg(1),4)
framemax = Word(Arg(1),5)

/* gracefully exit if no buffer */
GetMain
IF rc ~= 0 THEN EXIT 0

IF lockpal THEN DO
    IF framenum = 1 THEN
        LockRange 0 OFF
    ELSE
        LockRange 0 ON
    END
ELSE
    LockRange 0 OFF

Render Go

EXIT

/* End Render_Amiga.ifx
_____*/
```

In this script, the line, base = 'Autofx\_RendAmiga\_' is a pointer to the routine we want. The next line:

```
lockpal = GETCLIP(base||'Lockpal')
```

creates a variable for holding the status of the Palette, whether you checked the Lock Palette? Gadget or not. It will be 1 if locked, 0 if not. The next few lines hold some important values, the current frame number, main buffer name, swap buffer name, sequence number, and the max (highest) frame.

Pay special attention to the lines starting IF Lockpal then DO. These lines check to see if the palette Lock gadget was checked. If not, the whole IF..THEN..ELSE part is skipped, and the Main buffer is rendered with an unlocked palette.

On the other hand, if the gadget was checked, then we go on to see if we are on frame number one. If we are on frame number one, unlock the palette, so we can retrieve it from the first frame when we render it. If we're not on frame number one, then we keep the palette from the first frame by locking the palette. Notice when it says Lockrange 0? You can use 'ranges' with your palette, which is just little segregated chunks. Range 0 means all the colors in the palette, so lockrange 0 means lock all the colors.

This, my friends, is the offending bit of code that was driving me crazy in my perfectly black animation I mentioned last time! Ah ha! We'll have more to say about this in a minute! After that, the Render Go line sends the main buffer to be rendered.

OK. Now as you remember, at the conclusion of the last issue, I wanted a way to pick the palette the animation was going to use, rather than have it generated from the first frame. What we need is a way to select a palette file, and lock it before rendering to the anim.

First we need a palette file. This is accomplished by loading a typical frame from your animation, rendering it to the desired number of colors, and then saving the resultant 'RENDER' palette. From the Palette button, select the Render palette (a gadget on the

right of the palette Menu, it will have choices like 1-Draw, 2-Draw, etc. up to Render. Then click the save button. If your animation has wildly different colors during different parts, make a composite image with a number of different frames, then render it.

Next, we need to modify the above Render\_Amiga.ifx script, but also the Render\_Amiga.ifx.pre script I alluded to earlier:

```
/*
 * Render_Amiga.ifx
 * Written by Thomas Krehbiel
 *
 * Render to an Amiga display format.
 *
 * Inputs:
 *   Word(Arg(1),1) = Frame number (1 - N)
 *   Word(Arg(1),2) = Main filename ("-") if not
specified)
 *   Word(Arg(1),3) = Swap filename ("-") if not
specified)
 *   Word(Arg(1),4) = Sequence number
 *   Word(Arg(1),5) = Total number of frames (N)
 *
 * Returns:
 *   0 if successful, non-zero on failure
 *
 */
```

## OPTIONS RESULTS

```
base = 'Autofx_RendAmiga_'

lockpal = GETCLIP(base||'LockPal')

framenum = Word(Arg(1),1)
mainname = Word(Arg(1),2)
swapname = Word(Arg(1),3)
seqnum = Word(Arg(1),4)
framemax = Word(Arg(1),5)

/* gracefully exit if no buffer */
GetMain
IF rc ~= 0 THEN EXIT 0

IF lockpal THEN
    LockRange 0 ON
ELSE
    LockRange 0 OFF

Render Go

EXIT

/* End Render_wpal.ifx
_____*/
```

The above modified Render\_Amiga.ifx script, which I have saved as Render\_wpal.ifx, shows the very simple modification. The IF...THEN...ELSE sequence no longer checks for frame number one, it simply checks to see if the palette gadget was checked or not.

The real fun is in the Render\_Amiga.ifx.pre file. Since that file is so long, and much of it doesn't concern us at this juncture, I'm going to cheat a little, and just show the part I modified, plus enough of the old one so you know where I inserted the modifications.

```
/* Render_ifx.pre modified by Dave, many lines left
out for brevity */

SetRender Amiga
```

# Got Amazing?

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VOLUME 14, #8: August 1999

**New Products & other neat stuff**, phase5 at Software Hut, PFS3 with PFS Tools, Wasted Dreams, A4000 Power Tower conversion cases, Aminet Set 8, and more.

**QNX Amiga Developers Network**

**Amiga Inc.'s Linux Announcement**, "Linux gives us a better chance..."

by Jim Collas, President, Amiga Inc.

**SheepDog - HAVI?**, by Fleecy Moss.

**CamControl**, Downloading images from Olympus Digital Cameras to your Amiga, by Michael Tobin, M.D., PhD.

**Amiga! Yeah Baby!**, Retro look is popular again. Confused yet?, by Nick Cook.

**Scala MM400 Review**, Combine your graphics tools for great presentations, by Bill Panagouleas.

**ImageFX: AutoFX**, Tired of those senseless repetitive tasks?, by Dave Matthews.

**REBOL/Core - Part 2**, Scripting fundamentals, by Bohdan Lechnowsky.

**Amtrade HD Floppy Drive**, 100% Amiga compatibility, by Brad Webb.

**An Amiga Games Guide to the Web**, Looking for hints and cheats on-line, by Jake Frederick.

**AmiWest & World of Amiga London**, Amiga news from two continents.

**Jim Collas at WOA, Top 10 Questions, Amiga Inc. Press Conference**

**Amiga Tech Brief**, An introductory letter by Jim Collas and technology brief.

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**Amiga Games News and Previews**, Minimum Safe Distance, Maim and Mangle, Po Po Chicken, and Heretic II, by Jake Frederick.

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```
IF rc ~= 0 THEN EXIT rc
```

```
Render 'Colors' colorarray.ncolors
```

```
Render 'Dither' dithtype dithdir ditherr
```

```
Render 'Mode' hname vertarray.vert monarray.monitor
```

```
CALL SETCLIP(base||'DithType', dithtype)
```

```
CALL SETCLIP(base||'DithDir', dithdir)
```

```
CALL SETCLIP(base||'DithErr', ditherr)
```

```
CALL SETCLIP(base||'Colors', origcolors)
```

```
CALL SETCLIP(base||'Monitor', monitor)
```

```
CALL SETCLIP(base||'Horiz', horiz)
```

```
CALL SETCLIP(base||'Vert', vert)
```

```
CALL SETCLIP(base||'LockPal', lockpal)
```

```
/* My Modifications start here */
```

```
LockRange 0 OFF
```

```
RequestFile "Enter Filename of Desired Palette:"  
'IMAGEFX3:Storage/Palettes'
```

```
IF rc ~= 0 THEN EXIT 0
```

```
filename = result
```

```
loadpalette filename 8
```

```
LockRange 0 On
```

```
EXIT
```

```
/* End Render_wpal.ifx.pre
```

```
*/
```

Let's see what's happening here. First (after all the normal `Render_Amiga.pre` stuff happens) I unlock the palette. The next line puts up a file requester, asking for a palette filename. Notice the second part, `'IMAGEFX3:Storage/Palettes'`, this points the requester right to the directory where my palettes are stored.

What happens is, when you press the 'BEGIN' button in AutoFX, this file requester pops up, you choose your palette file, which then is transferred to the filename.

```
loadpalette filename 8
```

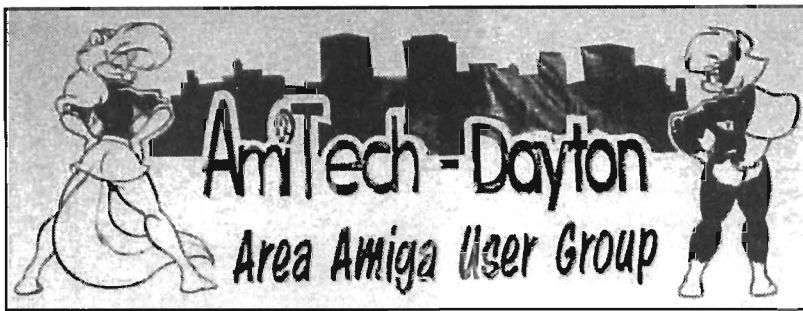
This command loads the palette you chose into the palette holder #8, which happens to be the render palette, right where we want it. Finally, the palette is locked again, and this script exits, and the next bit takes over till the whole animation is done.

Phew! Well, that's a lot to chew over for one article, so I'll leave it here for now. Try playing with these scripts, changing them, trying out different things. Be sure not to overwrite your original ImageFX scripts though! Always save your new file under a new name.

As always, you can reach me via e-mail at: [dsmatthews@geocities.com](mailto:dsmatthews@geocities.com).

•AC•





## AmigaFest 99

**Thanks to AmiTech Dayton, the Amiga crashed one of the biggest computer fairs in North America.**

*by Ron Schwartz*

AmigaFest 99 was a show within a show at the fall Computerfest® in Dayton Ohio. Computerfest® is the largest consumer computer show in the country, sponsored by a computer user group, the Dayton Microcomputer Assn.® (DMA®).

When AMICON elected not to have their Midwest Amiga Expo this year, AmiTech Dayton decided to pick up the initiative by sponsoring an all Amiga area within the fall Computerfest®. DMA®'s Computerfest® chairman, Randy Young, agreed to include AmigaFest 99. At that point, the lads from AmiTech Dayton had only a scant three months to organize their first AmigaFest.

There was concern that AmigaFest 99 would be swallowed up within the immense Computerfest® (August 28th and 29th at Dayton's Hara Arena) which regularly draws about 30,000 people over a

two day period. When all the dust cleared and the varying opinions about the value of participating in a predominantly PC show settled, there was a brave little band of twelve exhibitors that were willing to put their money where their mouths were.

Unfortunately, unlike an Amiga only show, there is no way to determine how many of the attendees were Amiga folks, or how far they had come to attend. There were contingents from as far away as Canada, Michigan, New York, Missouri, and Alabama.

Computerfest® draws celebrities and this year Stewart Cheifet, host of the PBS series "Computer Chronicles" was a special guest, touring the show, hosting a seminar on "Y2K Problems," and visiting with the public at the booth of Channel 16, the local PBS station.



**An A1200 Winner.**

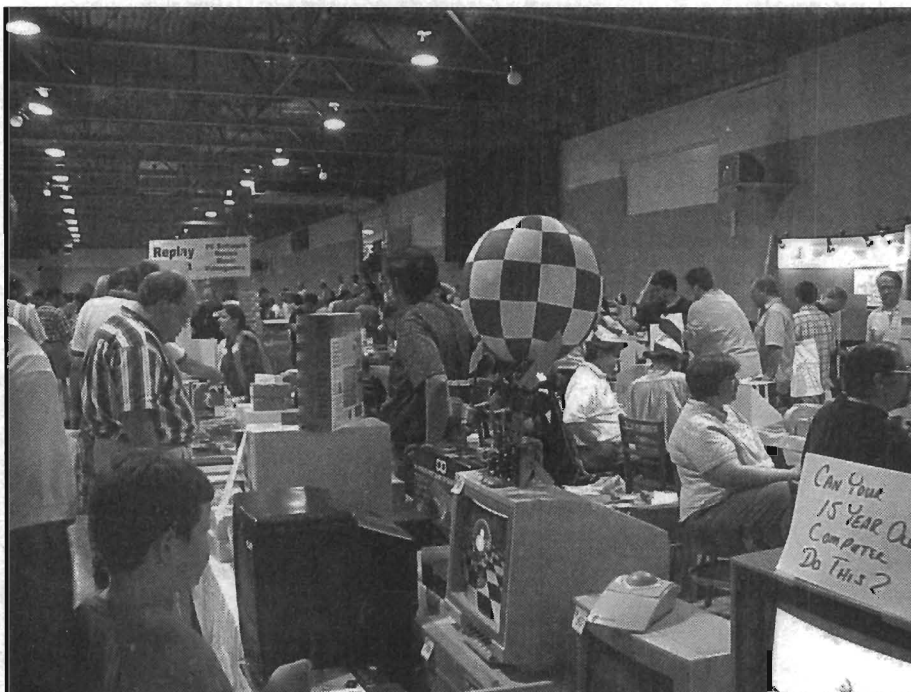
There were general interest seminars and presentations constantly throughout the two days on subjects such as doing business on the internet, internet safety, digital photography, networking, Y2K problems, and, most important, an Amiga Forum. The Amiga Forum, in the absence of any Amiga Luminaries, was a group discussion hosted by Ron Schwartz and Steve Cornett of AmiTech Dayton. Randhir Jesrani, from Compuquick Media Center, took some time out from his busy booth to field some questions, as a member of the Amiga Advisory Council.

In one corner of the North Hall, affectionately known as the flea market, was AmigaFest 99. It was immediately visible, as you entered the hall, due to a large, eye-catching banner of Amy the Squirrel and Sabrina designed by AmiTech members, Eric Schwartz and Jim Lawrence.

Amiga was not available due to conflicts with the Australian show one week earlier. This was too bad because there was an amazing amount of interest expressed by show attendees.

AmigaFest 99's twelve exhibitors included some of the regulars to Amiga shows and a few new to the scene.

As the group sponsoring AmigaFest 99, AmiTech Dayton, was there in force, led by president Phil Longo. They had a large display set up with a 20" monitor continuously running a Scala presentation with humorously captioned pictures of club activities. The group was also busy running a raffle. Amiga provided two A1200s and a number of other prizes to be



given away and that was supplemented by a number of other items provided by Software Hut and several of the exhibitors.

Dave Pearce, president, led an intrepid little group from AMICON, the user group from Columbus, Ohio. They kept busy taking turns recruiting, selling used equipment, and scouting the show looking for bargains. The North Coast Amiga User Group put in an appearance, doing much the same, while sharing space with Dan's Deals. The Indianapolis, Indiana, user group ARCUG was there, to publicize their upcoming show, Amiga Extravaganza 99 in Indianapolis, on October 9 - 10, 1999.

Compuquick Media Center was there in force with a complete selection of Amiga products, including several new items. Randhir Jesrani has been making the rounds of the Amiga shows this year and, since this Columbus, Ohio, dealer is also a distributor for some Amiga products, he has been a major force in maintaining the Amiga market (email Comquick@infinet.com).

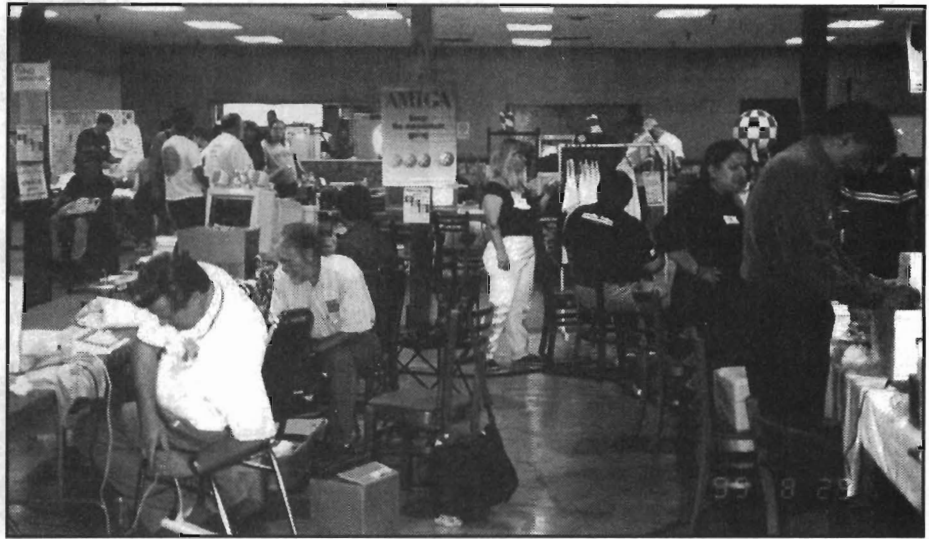
Frank Davis' FWD Computing from Mexico, Indiana, has also been covering all the Amiga shows. Unique among this group, however, is that they have been a regular at Computerfest® for several years. They specialize in software for the Amiga and were happy to be a part of AmigaFest 99 (email fdavis@iquest.net).

Dan and Diane Greathouse have a lot of friends in the Amiga community so Dan's Deals, dealer primarily in used Amiga equipment, was a popular place (email dan@ncweb.com).

Dayton is home to Eric Schwartz, an AmiTech Dayton member, had his E. S. Productions there in force with the usual selection of Amiga oriented T shirts, a display to show off Amiga animation capability, and video tapes of his animations as well as several used equipment items that sold relatively well (email erics@coax.net).

AmigaCafe, an IRC from nearby Convoy, Ohio, was represented by Lora Maher. This young lady is quite a technician. She displayed a 4000 tower conversion of her own design and was seen throughout the show advising others on potential conversions. They also had an impressive music demonstration with a leaning toward fusion/techno music (email saraba@wcoil.com).

Bob Scharp, representing Amigan-St. Louis, publicized Amiga 2K, The Gateway Amiga Show, scheduled for April 7-10, 2000. In addition, Bob was also representing *Amazing Computing*, taking subscriptions and passing out samples, and Brewster



Productions and their products for the Amiga, Payroll Plus and Organize Pro. This crew also initiated a fashion revolution in the Amiga area wearing Cat in the Hat hats (email bscharp@icon-stl.net).

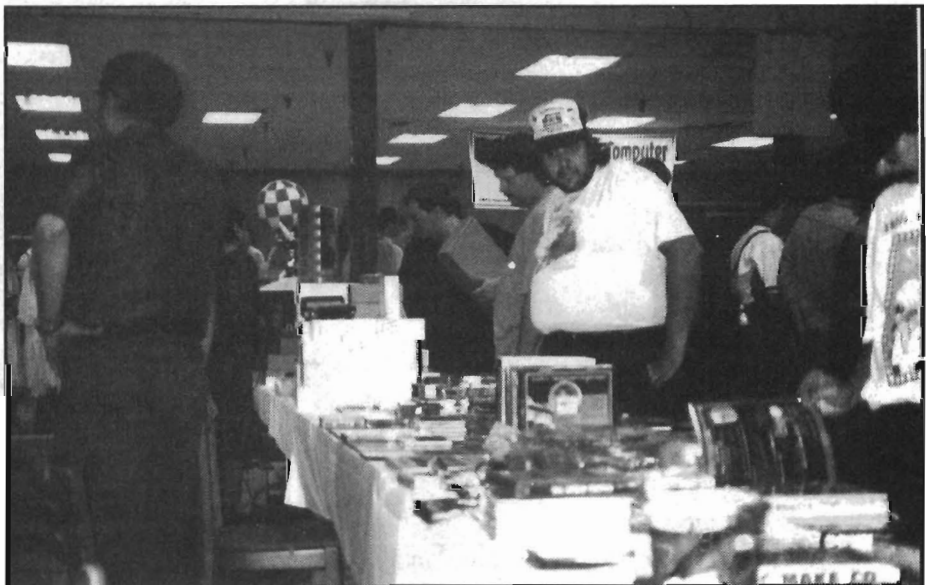
Nova Design was represented by Corinna Cohn who was demonstrating ImageFX 4, the latest version of this fantastic image manipulation system. Corinna was doing her usually impressive job of showing the capabilities of the software. They were also selling both it and Aladdin 4D.

Eric Wyatt decided to join the fun and demonstrate the capabilities of an Amiga with Video Toaster plus a Flyer. Eric's Company, Deacker Video Productions, makes training videos for some major companies in the Dayton area (email wyatt@main-net.com).

AmiTech Dayton, with the help of Len Carsner, gathered everyone Saturday night at Bulley's Sports Bar and Grille. No formal banquet, no speeches, just good food and fun. The group was small, about 36 people, and the predominant feedback was that a good time was had by all.

The feedback to AmiTech has been positive overall. Between the raffle and door prizes, 63 prizes were awarded. The two A1200s were won by Jeremy Black, from Westchester, Ohio, and Travis Little, from Indianapolis. AmiTech Dayton has expressed their gratitude to Amiga, Software Hut, Compuquick, FWD, Dan's Deals, Amigan St. Louis, and Amazing Computing for providing prizes and all their other support in getting the show on the road and making it a success. Their statement was, "If everyone enjoyed AmigaFest 99 as much as we did, it was a great success."

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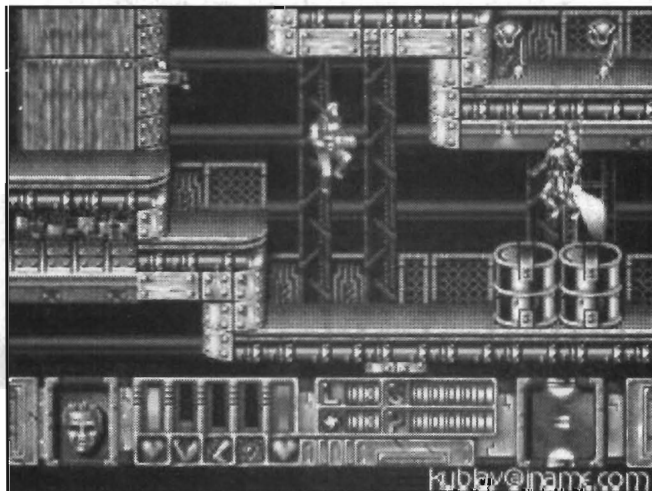


# Games News And Previews

**Nightlong, Worms:Armageddon,  
Land Of Genesis, and Eric  
Schwartz's Sabrina Offline are  
coming soon to your Amiga.**

*by Jake Frederick*

The wake of two major Amiga shows has brought some very exciting news to the Amiga gaming world. Amidst this excitement there is also a great deal of confusion. With the apparent split of the Amiga market, game developers are faced with the tough decision of which route to support. As consumers, we must also make this decision. phase5 has recently announced that its G3 cards will have a flashROM that can support up to three different boot kernals (QNX, Linux and WarpOS for example). As long as we have developers like this, planning for the future, no matter which direction it takes that decision, should come a little bit easier.



Darkage Software's platform/shoot 'em up, Land Of Genesis



Team-17 and Hyperion Software will produce Worms:Armageddon



ClickBOOM's Nightlong will come on three CDs.

## Nightlong

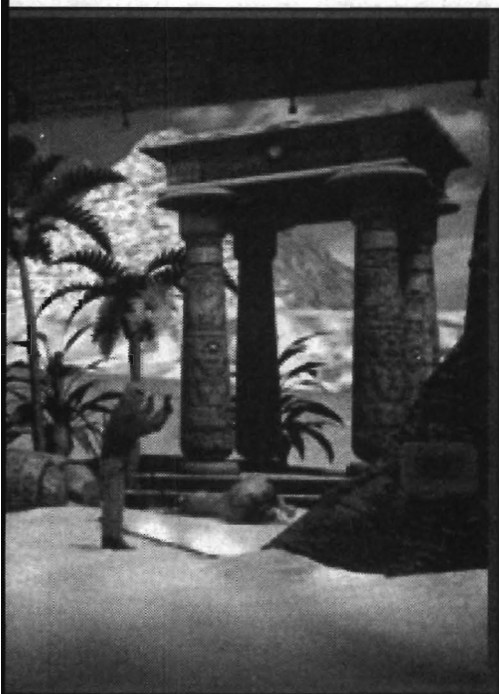
ClickBOOM has unveiled yet another PC game that they intend to port to the Amiga. Nightlong is a point and click adventure originally released by ex-Amiga developers Team 17. The game will come on three CDs which consists of over 80 locations, in-game movies, and recorded speech. All graphics are 16-bit so it's speculated that a graphics card will be required, however this has not been confirmed. Other details are nonexistent at the moment but you can be sure that more will surface in the coming months.

## Worms:Armageddon

In another surprising Team 17 related announcement, Hyperion Software has publicized its intention to bring us Worms:Armageddon. Hyperion has already received the rights to port the PC title which is a sequel to the original hit Worms. The first Worms made its debut on the Amiga and was one of the last games Team 17 released for the platform. Given a decent amount of sales, this may prove to them that the Amiga is still a viable platform for development. The game will be released for both classic Amigas (68k and PPC) and the Amiga NG, with the classic version arriving sometime at the end of the year.

## Foundation

The bad news is that, with the official closing of Sadness Software, the Settlers-type game Foundation will not receive any more updates. The good news is that the game is being re-released as Foundation: The Directors Cut by Epic Marketing/Islena Entertainment and will include version 1.25 of the updated engine which includes optimized graphics card support, Gouraud shading and a wealth of other updates. Even better is the fact that a sequel, Foundation's Edge, will be released later this year. The game will be totally rewritten in portable C++ to allow 68k, PPC, and possibly other CPU versions. It will also feature new graphics, a redesigned GUI, new levels, new music and sound, and improved gameplay.



### Sabrina Offline

Those who are familiar with the artwork of Eric Schwartz will be happy to know that Digital Images is developing a 3D platform game for next generation Amigas based on his cartoon characters. DI is hoping Sabrina Offline will be heralded as the "best game ever" due to its unique approach to the platform genre. Most of the details of why it will be so unique are being kept quiet for now but the authors have stated that there will be six playable characters, a non-repetitive game design and a "secret level structure". This all sounds very interesting, let's hope Digital Images can earn the "best game ever" title they are looking for.

### Land Of Genesis

Land Of Genesis is a platform/shoot 'em up from Italian developers Darkage Software that has you infiltrating Mars to exterminate the hideous results of a genetic experiment gone wrong. The game will require you to blast your way through five levels with over 120 different enemies. Other features include 8 megs of in-game graphics, video sequences, digital audio tracks, and over 2000 frames of enemy animation. The game is intended to be released on CD-ROM by October.

If you have any announcements you would like to share with Amiga gamers send me an e-mail at [gonzo@acadia.net](mailto:gonzo@acadia.net). If you're not net accessible write me at: Jake Frederick c/o Amazing Computing/ Amiga, PiM Publications Inc., P.O. Box 9490, Fall River, MA 02720.

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# Muscarine

**An entertaining PD game, but not one for the young and impressionable.**

*by Jake Frederick*

The Amiga has had a rather sparse selection of point and click adventures in recent times. With the exception of Sixth Sense Adventures, Monkey Island buffs haven't had a whole lot to sink their teeth into. Fortunately the Amiga has a flourishing PD scene and a few great utilities like GRAAL (Graphic Adventure Authoring Language, available from [Aminet/games/role](http://Aminet/games/role)) to assist in the creation of point and click masterpieces. Muscarine, a strange psychedelic adventure created with GRAAL 2.3 may be just what hungry adventure fans are looking for as long as they are prepared for a healthy dose of oddness.

Be forewarned, if you have any objections to subtle and sometimes blatantly obvious illegal substance references you should turn the page now. The first task presented by Muscarine is the finding and preparation of psychedelic mushrooms which will transform the normal environment that starts the game off into a strange world of angry faced suns and strange green men who sit vertically on walls. Not that this is all without a purpose, mind you, with a little exploration you soon find that you've been sent on a quest to destroy the universe to counteract the vast number of video games that require you to save the universe, thus keeping up the cosmic balance.

Despite the game's odd atmosphere most of puzzles are fairly easy to figure out which makes the game flow along nicely with little frustration. You certainly won't get anywhere using conventional logic, though. One piece of the twisted puzzle has you finding out from a magic painting that the creature Grog

Greentooth's leg was amputated after he lost his boot because his leg was cold. In order to access a crucial passageway you must somehow convince him to amputate his remaining leg.

The hand drawn graphics are simple yet stylish for the most part. This coupled with some great (though not all original) music creates the bizarre mood that is upheld consistently throughout the game. The GRAAL engine doesn't appear to show any limitations, though it stays squarely within the boundaries of standard point and click conventions, which is a good thing in this case. It offers your standard array of options such as "pick up", "look", and "use" as well as the all important "consume" which is crucial to your adventuring.

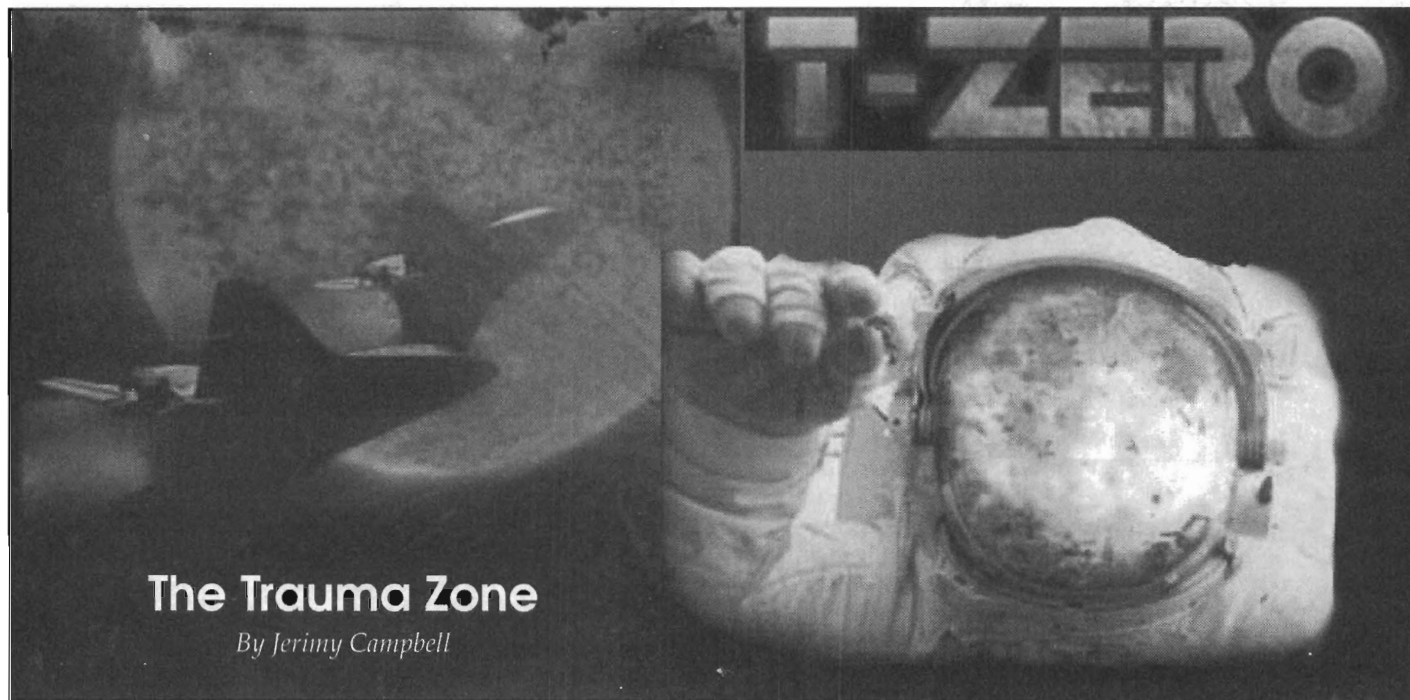
In a nutshell Muscarine is a nice little adventure game that is not for the easily offended. Given its simplicity and briefness (the authors states that it's only the first part of what will become a larger adventure) it may not appeal to hardened adventurers but it should amuse the average gamer for at least a little while, and it may make the wait for Gilbert Goodmate just a little bit easier. Rating: B

Download Muscarine from [Aminet/game/role/Muscarine.lha](http://Aminet/game/role/Muscarine.lha) or <http://www.geocities.com/Athens/Troy/7871>

•AC•







## The Trauma Zone

By Jeremy Campbell

T-ZerO is the latest Amiga offering from PXL Computers and ClickBOOM. It is your basic side-scrolling shoot-em-up, but it offers more options than you may know what to do with. T-ZerO has been programmed with a degree of sophistication that I've never seen before in a shoot-em-up. When I first heard that ClickBOOM was doing a shoot-em-up, I was thinking, why? How can you top the likes of classics like ProjectX, Apocalypse, or Agony. Well, let me just say that ClickBOOM has pushed shoot-em-ups and the Amiga's hardware to the max with T-ZerO.

The Trauma Zone, or T-ZerO as it is called, is an evil dimension discovered by earth astronauts. It is known that the guardians of this dimension plan to destroy not only the Earth but the entire dimension

in which earth exists. Your task is to battle your way through the domain of five different guardians, destroy them, then collect their diamond. After you've done that, you get to take a crack at the main guardian, Kakistos, which means "the worst of the worst." Good luck beating Kakistos, you're going to need it.

Every aspect of this game is very professional. The graphics include rendered/raytraced on-screen animated objects and very realistic explosions. The in-game sound effects are superb and I found that the varying CD soundtrack added to the enjoyment of play. The graphic detail is excellent and the colors are rich. Even the main menu is gorgeous with its animated blue flames flickering at the bottom of the screen.

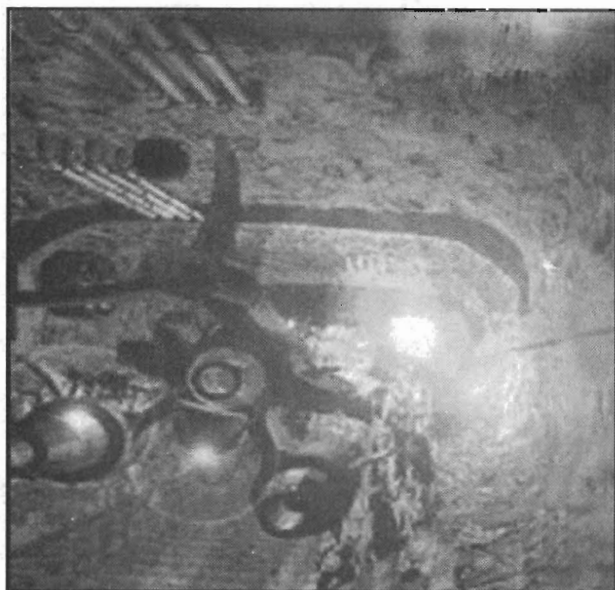
T-ZerO has a uniquely entertaining introduction sequence. It begins with a small but very impressive animation of an exploding shuttlecraft which is displayed in the reflective visor of an astronaut's helmet (way cool). Then there's a quick narrated portion that transitions into a short but attractive picture slideshow with background music. The final sequence is a fairly long but suitable animation of ships flying around the T-ZerO dimension blasting various enemies.

Before you begin play, you must select your craft. The craft selection screen allows you to choose the color of your ship and has a 3D rendered/raytraced spinning model of each craft on screen. There is also a female voice that explains the capabilities of each craft in detail, which is a nice addition.

It seems ClickBOOM has spared no expense at adding fluff to T-ZerO. Much of it is overkill, in my opinion, but I'm sure there are plenty of people who will love the added eye-candy. I honestly don't recall ever having played a shoot-em-up that required this much concentration or caused this much frustration. I suppose it is also these factors that have caused my thumb to cramp up and the bottom of it to flatten from endlessly holding the fire button down.

Initially, I and other fellow gamers, felt the game might be too hard. Even when set on easy, it's tough. But after investing time playing the game, I find it to be irresistibly addictive. I caught myself murmuring "just one more time" more often than I can count. Each time I play it, I progress just a little bit more and my skill improves slightly which keeps me hungry for more. This game is tough, but, with practice, you can master it.

This is certainly a game that would benefit from graphics card support and I don't understand why ClickBOOM neglected to make a version for graphic card users. Also, if you take away all the bells and whistles, T-ZerO is at its core a standard shoot-em-up. So why not make a toned down 32 color version for non-AGA Amigas?





Installation has five options and it is fairly standard with no real surprises except a set-up program that must be executed where you enter the device that controls your CDROM drive (i.e. cd.device or scsi.device, etc.) and the drives unit number. I didn't have any difficulty installing the game but I did have a tough time getting it to run at first.

T-ZerO has a rather unusual save mode called save slots. It's a little difficult to explain, but seems to be complete and effective even if it takes some getting used to. Another dislike is that the game requires you to boot in PAL display mode, and that can be damn annoying.

The manual looks great and covers just about everything you need to know about the game. It does mention T-ZerO's Chip RAM greediness, but it doesn't stress how Chip RAM hungry it really is. I couldn't get it to run from Workbench no matter how many things I turned off, disabled, cut back, or removed from my start-up sequence.

If you've never been into shoot-em-ups then you'll probably hate this one, but if you're an enthusiast—such as myself—then it's a must have. I give it an "A" rating simply because it has held my interest throughout the review and beyond. I honestly can't say that about most other games I review.

The system requirements for T-ZerO are AGA, 030 CPU, and 8 Mb RAM, but they recommend that you have an 060 processor. It was tested on an A1200 060, 50 Mb RAM, 32x CDROM drive, and OS 3.0. You can get more information at: [www.clickboom.com](http://www.clickboom.com)

Note: I sent an email to ClickBOOM with questions and complaints about the drawbacks of this game and never received a response. In all fairness, it's possible the proper person or persons never got my mail or maybe they're still working on a reply. But as of this writing, I have not received a reply.

## Getting Things Going

1. Hold down both mouse buttons and select PAL display mode. I also disabled DF1: and CC0: to free even more Chip RAM.
2. Select boot with no startup-sequence.
3. At the prompt I had to execute cyberpatcher. (If you own a Blizzard 060 this makes the game run more smoothly.)
4. I then typed; Assign T0: Work:Games/T0 (This assign enables the between level movies. The game will run without this assign.)
5. To execute the actual game I had to type; Work:Games/T0/T-ZerO. The manual did not instruct you on how to do this if you experienced difficulties, so, hopefully, this information will be of help.

## Important Tips

- Always keep an eye on your ship.
- Steer clear of slow moving projectiles.
- Conserve your nuclear weapons.
- Don't be overly concerned with picking up bonuses
- Try to take out anything that is shooting at you first.
- Remember that the Alt, Amiga, or Shift keys execute your Nuclear Blast—you'll need them.

## Main Menu Options

- Story or Arcade mode-** story mode has in-between level animations and is longer with more system requirements. Arcade mode is a more straight forward, standard shoot-em-up style.
- One or Two player Mode-** this is self explanatory, but two players sharing the battle load can make things much easier.
- Hard or Easy Setting-** easy limits the number of levels, but I didn't notice the gameplay getting much easier.
- Autofire-** you can turn this on or off, but this option puzzles me because I can't comprehend ever wanting to turn it off, so why even include it?
- Low/Mid/High Inertia-** adjusts the sensitivity control of your craft. I found the differences in control from the different settings to be so slight they were almost non-detectable.
- Movies On/Off-** turns the small in-between level 3D animations on or off. I left them off because I found them to be nothing but a time consuming nuisance, although they do look nice.
- No/Low/High Back Animations-** sets the detail level of the beautiful background animations. They really are fun to look at and therefore can also be a bit distracting. They also bog down the CPU even on fast systems. I was forced to turn them off because when things got hectic they were causing a nasty bug where the screen became a jumbled mess—which usually resulted in my demise.
- No/Low/Med/High Transparency-** selects the degree of transparency for missile trails and explosions. This one can also affect CPU performance so I left it off just to be safe. There is also a selection for the color of the transparency.
- High Tech or Arcade Style-** changes both the CD music and the look of the bonuses and power-ups. I preferred the high tech look over the goofy looking pieces of fruit and stuff that arcade game style had.
- Status Bar On/Off-** this is barely noticeable in the upper left corner of the screen but some people may prefer it off.
- SFX volume Off/Low/Mid/High-** controls the loudness of explosions and sound effects. This one's best left cranked up.
- The Top 10 high scores-** this provides two separate screens for both Arcade and Story mode, complete with a unique smooth-scrolling animation of crosses.

And yes, it has a Quit option!



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